# THE IRON TRADE REVIEW

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## THE WEEK IN IRON CIRCLES.

### THE MARKET AT LARGE.

An increasing volume of business done at the expense of prices, is reported in the iron trade for the past week. Activity in finished lines has been more pronounced in the Central West and the Chicago district, while Eastern districts, in part because of labor conditions, are slower to come out of summer dullness. The pig iron market shows further yielding by producers and the competition between Southern furnaces on the one hand and Northern furnaces on the other hand is sharper. The leading Southern producers are now selling in Eastern territory at $11, Birmingham, for No. 2 foundry, and while in the Central West the bulk of the early delivery business is done at $11.50 and $11.75, Birmingham, Northern furnaces are selling at figures which under present freight rates mean $11, Birmingham, for Southern furnaces that would compete. Reports from the foundry industry indicate differing conditions, but on the whole a decreased melt of iron. In some centers the scale of operations showed a considerable curtailment in August, as is indicated by reports summarized elsewhere in this issue. The remarkable feature of the blast furnace statistics for Sept. 1 is that the estimated pig iron production in August was 1,616,000 tons, or 26,000 tons more than in July, while estimates of stocks show an increase of but 58,000 tons (to a total of 400,000 tons) as against 85,000 tons increase in July. The imports in August were 32,000 tons, against 38,000 in July, as compared with an average of 75,000 tons for the first six months of the year. For foundry purposes the import purchases are at an end. Foreign producers cannot meet domestic prices. The report that the United States Steel Corporation had bought or was about to buy 100,000 tons of Bessemer iron this week is incorrect, the pig iron committee having decided to make no purchases of Bessemer iron this month. Meantime merchant furnaces in the Mahoning and Shenango Valleys are piling Bessemer iron because steel works cannot take it, and one important steel interest in the Pittsburg district that was importing Bessemer and basic iron one year ago is now a seller of both. A good many blast furnaces making foundry pig are preparing to blow out on the completion of present contracts, and on a very considerable movement of that sort are based any hopes that may be entertained of arresting the present tendency of prices. The problem that exercises both producers and consumers of rolled products is the extent to which the great change that has come in the pig iron market will affect finished material. Steel manufacturers meet this week to consider what change, if any, should be made in the billet basis, in view of the settling of Bessemer iron. Sales of steel have been light, the Chicago market showing the chief interest. The policy of the railroads in respect to improvements will largely determine the course of the finished material market in the next two months. Rail mills are well employed, but new business is not large. While the whole Western railroad situation is now supposed to hang on the weather conditions of the next fortnight there is already assured to the railroads in that section all the business they can handle in the coming winter. Agricultural implement manufacturers in the Central West have been buyers of bars and plates in the past week, many having delayed purchases until the very eve of fall operations. Stocks in consumers' hands have run very low, and the present buying movement is under pressure of immediate needs. The most encouraging news for structural and plate mills is that from New York indicating the probable placing of 350,000 tons in the present month. Of this 100,000 tons will be required for the new Blackwell's Island bridge and of the balance the greater part is for railroad work throughout the country. The price of plates has suffered in the competition of the week and it is intimated that Eastern plate mills have cut the pool price on Central Western business. That the United States Steel Corporation should again seek foreign business in finished material, as reported in the dispatches, is entirely natural now that home demand is receding from boom proportions.

### PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Sept 16.

There has been a still further softening of the pig iron market in the past week, and prices are nearly to the point where some of the less modern stacks, with high production costs, will be compelled to blow out. Transactions continue to be confined to small lots entirely, and consumers are not interested in covering future requirements. The report that the United States Steel Corporation is arranging to buy 100,000 tons of Bessemer is entirely unfounded. At the meeting of the pig iron committee held last week it was decided to make no purchases of iron during the present month, and present conditions considered it is extremely doubtful if any iron will be purchased in October. All deliveries to corporation plants of Bessemer iron from merchant furnaces in the Valleys have been held up and Bessemer iron stocks are rapidly accumulating. Unless shipments are soon resumed it is probable that the merchant furnaces, unable to dispose of their accumulating stocks, will be compelled to bank or blow out entirely. The Jones & Laughlin Steel Co., which last year figured prominently as a heavy buyer of foreign iron, is now offering both Bessemer and basic for sale on account of the shortened requirements of its steel plant. On forge iron as low as $14.65 has been quoted on a 500-ton order, while $14.75 was done on a small lot. Northern No. 2 is selling at $15.50 to $15.85, Pittsburg, and these low prices only interest foundrymen to the extent of placing an occasional car lot order for immediate shipment. Bessemer iron is held at $16 at Valley furnace, and this price could no doubt be shaded on a fair sized order. Basic is quoted at $15.50 to $15.75 at the furnace, while Virginia furnaces are offering their basic product in this market at prices ranging from $15.75 to $16. The differential of $1 per ton which the Southern pig iron operators have established in favor of Eastern buyers, excluding Pittsburg and the Pittsburg district, has resulted in making local consumers hold off still further. No. 2 foundry is now being sold east of here on the basis of $11 Birmingham, and in Eastern districts most closely competitive with Pennsylvania furnaces, some Southern producers are willing to sell at $10.75 on large lots.

A meeting of the steel billet pool will be held in New York on Thursday. Since the establishment of the present prices little steel has been sold by the mills in the association and some of the members doubt very much if a reduction would result in an increased demand. Despite re-

ports to the contrary a conversion price of $9 per ton is still being made by the association mills. It is probable that one or two mills now outside of the pool will be admitted to membership, thus further strengthening the organization. Eight of the largest steel producers in the country now make up the association.

In finished lines orders are more numerous than they have been for some time, but the aggregate tonnage is very small. Comparatively few consumers are covering future requirements and the fact that immediate shipment is asked on nearly all of the orders booked indicates that stocks are very low. There is some contract buying of bars and plates by agricultural works. In order to further facilitate deliveries on pipe the National Tube Co. is considering the advisability of starting the pipe mill at South Sharon, Pa., which up to the present time has never been operated, on account of the relatively high cost of production. However, the demand for pipe is so very heavy at this time that it is probable that this mill will be operated for a brief period at least to tide over the present rush for material. General demand for plates continues very light, while the output of structural material in this district continues greatly curtailed. Structural fitters are known to have very small stocks and in a number of instances have traded material with one another rather than go to the mills. Demand for tin plate continues good for this season of the year, while the sheet trade is improving. At the meeting of the shafting manufacturers held in New York last week prices were reaffirmed.

**Pig Iron.**—The present downward tendency of the market is discouraging rather than encouraging consumers to cover for future requirements, and what few orders are being placed are limited to small lots entirely for prompt shipment. Carload lots of Northern No. 2 are selling at prices ranging from $15.50 to $15.85, while forge iron is held at $14.65 to $14.75. It has been reported that the present Southern association schedule is being evaded by the sale of small lots of foundry iron on specification, giving the consumer practically a No. 2 analysis and selling the iron as a No. 4 brand. How much of this is being done cannot be ascertained. Bessemer iron is now accumulating very fast at Valley furnaces on account of the orders issued by the United States Steel Corporation to hold up shipments until further notice to its idle steel plants in this and the Valley districts. As the demand for Bessemer is extremely limited some of the stacks will no doubt be compelled to bank shortly in preference to further accumulating stocks. This week the stack of the Clinton Iron & Steel Co. was banked, but it is believed that operations will be resumed shortly. We revise quotations as follows:

| | |
|---|---|
| Bessemer, Valley | $16 00 to 16 25 |
| Bessemer, Pittsburg | 16 85 to 17 10 |
| No. 1 Foundry | 16 00 to 16 50 |
| No. 2 Foundry | 15 50 to 15 85 |
| Gray Forge, Pittsburg | 14 65 to 14 75 |
| Chilled Basic, Valley | 15 50 to 15 75 |
| Chilled Basic, Pittsburg | 16 35 to 16 60 |

**Steel.**—Transactions in steel continue to be limited to very small lots and the present surplus production of the mills in the pool, although greatly curtailed by the shutting down of mills, is not being disposed of. At the meeting to be held on Thursday at New York, the few steel mills of importance outside of the association will probably be admitted to membership, which will still further strengthen the organization. Prices remain unchanged as follows: Bessemer billets 4x4 inches and slabs up to and including .20 carbon, $27, Pittsburg, Wheeling or Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; .21 to .60 carbon, $1 advance, and .61 to 1.00 carbon, $2 advance; open-hearth billets up to and including .60 carbon, $28, and over .60 carbon, $29; billets smaller than 3⅞-inch and sheet and tin bars are $1 per ton extra; Bessemer rods, $35.50 to $36 and open-hearth are held at $1 advance.

**Ferro-Manganese.**—Domestic 80 percent continues to be quoted at $49 per ton in carload lots, delivered at buyers' mill. On a large tonnage this price could be shaded.

**Skelp.**—Steel skelp, both grooved and sheared continues to be held at 1.60c to 1.65c, while iron sheared is held at 1.75c to 1.80c and grooved at 1.70c to 1.75c.

**Muck Bar.**—The market is very quiet and quotations are held nominally at $29 to $29.50.

**Spelter.**—The spelter market is quiet and prime Western grades are now held at 5.83½c to 5.85c.

**Rails and Track Material.**—The rail mills at Braddock and Youngstown, O., continue in full operation and specifications continue very heavy. Buying for delivery next year has not been very brisk during the past few weeks. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $33.50; 16 and 20 pounds, $32.25 to $33; 25 to 40 pounds, $32 to $32.50. Track material: Spikes, 2.05c to 2.10c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rails contracts, otherwise 2c to 2.10c is asked.

**Plates.**—Specifications from steel car plants continue to fall off and plate mills have greatly curtailed output. It was reported from the East during the week that the mills in that part of the country are shading present agreed prices. During the week the Riter-Conley Mfg. Co. received an order for riveted pipe which will consume 1,800 tons of plates. Prices are unchanged, as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16-inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds, for less than carload lots. Terms, net cash, in 30 days.

**Bars.**—Small orders for steel bars for prompt shipment have been very numerous during the week, as the agricultural implement manufacturers are preparing to resume operations in full on Oct. 1. The buying for future deliveries has been heavier from Eastern than from Western consumers, although the total business taken up to date for future requirements is relatively light. While iron bars are being sold in other districts of the country on the basis of 1.50c at mill, local mills have been asking 1.75c. It is needless to say that no business is being taken at this price. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; common bar iron, 1.60c to 1.65c, Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

**Structural Material.**—Stocks of structural fitters all over the country are known to be very low, and while they have no great amount of business booked, their current orders should no doubt result in some buying in the near future. Output of structural mills in this district continues to be curtailed. We quote: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

**Sheets.**—There is a better demand for both black and galvanized sheets and jobbers are buying to complete their stocks. Concessions continue to be granted, however, and quotations on black sheets in 500-bundle lots and over are as follows: No. 28, 2.65c to 2.70c; No. 27, 2.55c to 2.60c; No. 26, 2.45c to 2.50c; Nos. 22 and 24, 2.35c to 2.40c; Nos. 18 and 20, 2.25c to 2.30c; Nos. 14 and 16, 2.15c to 2.20c; Nos. 10 and 12, 2.05c to 2.10c. Galvanized: No. 16, 2.55c to 2.60c; No. 18, 2.80c to 2.85c; No. 26, 3.30c to 3.35c; No. 27,

**Pipes and Tubes.**—It is probable that the pipe mill at South Sharon, Pa., erected by the Sharon Steel Co., and which has never been operated, will be placed in operation by the National Tube Co., owing to the pressing demand for deliveries. Current business is heavy and the tonnage now booked will insure full operation until the first of the year. We quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

3.55c to 3.60c; No. 28, 3.80c to 3.85c; No. 29, 4.30c to 4.35c; No. 30, 4.45c to 4.50c.

MERCHANT PIPE.

| | Steel Pipe. Black. Percent. | Steel Pipe. Galv. Percent. | Wrought Iron Pipe. Black. Percent. | Wrought Iron Pipe. Galv. Percent. |
|---|---|---|---|---|
| ⅛, ¼ and ⅜ inch | 68 | 58 | 65 | 55 |
| ½ inch | 70 | 60 | 67 | 57 |
| ¾ to 6 inch | 75 | 65 | 72 | 62 |
| 7 to 12 inch | 69 | 59 | 66 | 56 |
| *Plugged and Reamed* | | | | |
| 1 to 4 inch | 73 | 63 | 70 | 60 |
| *Extra Strong Plain End* | | | | |
| ⅛ to 8 inch | 67 | 57 | 63 | 53 |
| Threads only | 66 | 56 | 62 | 52 |
| Threads and Couplings | 65 | 55 | 61 | 51 |
| *Double Extra Strong Plain End* | | | | |
| ½ to 8 inch | 59 | 49 | 55 | 45 |
| Threads only | 58 | 48 | 54 | 44 |
| Threads and Couplings | 57 | 47 | 53 | 43 |

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

*Steel.*

| | Percent. |
|---|---|
| 1 to 1½ inches | 45 |
| 2¼ to 5 inches | 62½ |
| 1¾ to 2¼ and 6 to 13 inches | 52½ |

*Iron.*

| | Percent. |
|---|---|
| 1 to 1½ inches | 86½ |
| 2¼ to 5 inches | 45½ |
| 1¾ to 2¼ and 6 to 13 inches | 85½ |

CASING.

| | S. and S. Percent. |
|---|---|
| 2 to 3 inches | 58 |
| 3¼ to 4 inches | 60 |
| 4¼ to 12½ inches | 63 |

**Wire and Wire Nails.**—The buying of wire and wire nails on the part of jobbers continues quite heavy and the fall trade promises to be brisk. Prices are firm and unchanged as follows: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

**Merchant Steel.**—At a meeting of the shafting manufacturers held in New York last week prevailing quotations were reaffirmed. Local mills have closed contracts for nearly 12,000 tons of soft center plow steel for delivery within the next year, while some of the contracts closed by a number of the Western plow manufacturers cover a period of five years. While the syndicate quotation on this steel is 5 cents a pound it is said that this price has been shaded fully one-half cent, while open-hearth soft center steel is being offered considerably below this figure. We make the following quotations: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots. Tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. Tool steel is quoted 7 cents and upwards, according to the grade.

**Old Material.**—The market continues very quiet and with the large number of iron and steel mills shut down there is little indication that there will be a revival of buying for some time. We make the following quotations, gross tons: Heavy melting stock, $17 to $17.25; cast scrap, $15.50 to $15.75; borings, $7 to $8 and turnings $10 to $11; No. 1 wrought scrap, $14.25 to $14.50.

**Coke.**—Should the present output of the Connellsville region continue until the end of the year, and there is little indication that there will be much of a reduction, it is estimated that the output for 1903 will reach 15,000,000 tons, an increase of nearly 2,000,000 tons over last year. The large number of new ovens built in the region the latter half of last year and the first half of this year have contributed this immense increase, but as there has been a great falling off in new construction during the past four months output next year cannot possibly show a proportionate increase. For the week ending Saturday, Sept. 5, the output of the upper region reached 250,120 tons and that of the lower region 54,855 tons. Strictly Connellsville furnace coke is held at $2 to $2.25 and foundry at $2.75 to $3. Outside furnace coke is quoted at $1.50 to $2 and foundry at $2.25 to $2.50.

## CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, Sept. 15.

Improvement is noticeable in the condition of finished products, buying of all materials having been better during the week under review. This is in contrast with the pig iron market, which maintains its uninteresting status, The increased activity in mill products has created a more optimistic feeling among sellers regarding the outlook, and the belief is general among these that the market has made the anticipated turn for the better. The situation in this section warrants this view, for buying of bars, sheets, plates, merchant steel, billets and wire products has been of greater volume than for some time past. Bar iron has sold during the week in 1,000-ton lots on the basis of 1.55c Chicago, for deliveries extending to the end of the year. Sheets are firmer, with fewer reports of shaded prices. Specifications on plates are of greater tonnage and coming in more freely. Bale ties, wire nails, smooth and barbed wire are in heavy demand, mills being from two to four weeks behind in deliveries. Among the contracts placed for smooth wire was one for nearly 10,000 tons, the whole to be delivered prior to Dec. 31. Bessemer and open-hearth billets are fairly active in lots of 400 and 500 tons each. Rails and structural steel are quiet, although several large contracts for the latter are pending. The dark spots on the metal horizon are pig iron and scrap. While few foundrymen have the confidence to place contracts for season requirements, there is a brisk demand in small lots. Old material is very dull, and quotations have fallen to a lower notch during the week. Coke is unchanged, buying being regulated very largely by conditions in the raw metal market.

**Pig Iron.**—The attitude of buyers in this section is still a waiting one, and in no feature has the market changed from the conditions under which it has labored for several weeks past. Sellers are not discouraged over the situation, however, many regarding it as a strong one, because of the fact that few melters have stocks of any size in their yards or contracts placed for deliveries extending beyond 60 days. Practically the entire foundry trade in this section may be said to be in the market, and while melters are purchasing only in small lots, the aggregate tonnage of the week's sales comes near to representing the weekly consumption of this territory. These orders are many of them placed at $11.75, Birmingham, and since their volume is large enough to take up the daily output of a majority of the furnaces in the market, producers are not uneasy as to the outlook. On larger lots $11.50 appears to have been done. Indications are not wanting that before long the car shortage will stiffen prices. It is already being felt in certain sections of the South, the Louisville & Nashville road having notified its agents that none of its cars are to be shipped to foreign points. In the North, the difficulty of getting cars has been felt by many shippers in the past two weeks, and serious delay to freight in transit has been caused by inefficient switching facilities. Little independent iron has been offered in this market during the week, and

reports of shaded prices are conspicuous by their scarcity. Our quotations follow:

| | |
|---|---|
| Lake Superior charcoal | $18 50 to 19 00 |
| Local Coke Foundry No. 1 | 17 50 to 18 00 |
| Local Coke Foundry No 2 | 17 00 to 17 50 |
| Local Coke Foundry No. 3 | 16 50 to 17 00 |
| Local Scotch Foundry No. 1 | 17 50 to 18 00 |
| Southern Coke No. 1 | 16 35 to 16 85 |
| Southern Coke No. 2 | 15 85 to 16 35 |
| Southern Coke No. 3 | 15 35 to 15 85 |
| Southern Coke No. 4 | 14 85 to 15 35 |
| Southern No. 1 soft | 16 35 to 16 85 |
| Southern No. 2 soft | 15 85 to 16 35 |
| Southern Gray Forge | 14 85 to 15 10 |
| Southern Silveries (4% to 5% silicon) | 18 35 to 18 85 |
| Southern Silveries (5% to 6% silicon) | 18 85 to 19 35 |
| Jackson Co. Silveries (6% to 8% silicon) | 20 30 to 21 30 |
| Jackson Co. Silveries (8% to 10% silicon) | 21 30 to 22 30 |
| Ohio Strong Softeners | 21 00 to 22 00 |
| Alabama and Georgia Car Wheel | 25 35 to 26 35 |
| Malleable Bessemer | 17 50 to 18 00 |
| Basic iron | 16 35 to 17 35 |

**Billets.**—Several sales of Bessemer and open-hearth billets in 400 and 500-ton lots have been made during the week, and in a small way, forging billets have been fairly active. Prices are held firm on the circular basis as follows: Bessemer, $28; open-hearth, $29, and forging, $32, Chicago delivery.

**Bars.**—The sales of bar iron during the week show a marked improvement over those of several weeks preceding. The buyers come from all branches of the consuming trade, several placing contracts for 1,000 tons and more, deliveries extending into the new year. Prices are firm on the basis of 1.55c, Chicago. Western consumers of steel have not bought as freely in this market as is reported from Eastern mills, though the tonnage placed is of fair proportions. Store trade in both products shows an improvement. We quote mill shipments, Chicago delivery, iron, 1.55c to 1.60c; Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c. Quotations from store: Iron, 2c for carload lots and over, and 2.10c for less than car lots; steel, 1.90c for car lots and 2c fro lesser quantities, rates; hoops, 2.30c to 2.40c; angles, 2.10c rates.

**Sheets.**—Demand shows an improvement though it is not yet of large proportions. Heavy gauges are moving more freely than lighter sizes. Fewer reports are heard of prices shaded below the circular basis. We quote black sheets, mill shipments, f. o. b. Chicago, No. 27, 2:71½c to 2.81½c; No. 28, 2.81½c to 2.91½c. Galvanized from mill, carload lots, Chicago delivery, 75 and 10 to 75 and 10 and 2½ percent. On lots from store, we quote, No. 27 black, 2.90c to 3.05c; No. 28, 3.05c to 3.15c; galvanized, 75 to 75 and 5 percent.

**Plates.**—Mills report that specifications are coming in more freely, though new business is light. All producers can stand a considerable increase in specifications, both they and jobbers having accumulated stocks during the slack period. We quote mill prices, Chicago delivery: Tank steel, ¼-inch and heavier, 1.75c; flange steel, 1.85c. Prices for lots from stock, tank steel, ¼-inch and heavier, 2c to 2.10c; 3-16, 2.10c to 2.15c; No. 8, 2.15c to 2.20c; No. 10, 2.30c to 2.35c; flange steel, 2.40c to 2.50c.

**Structural Material.**—The week has been without interest, sales being of light volume. Several large contracts are pending, but it will be some time before these are placed. We quote mill shipments, Chicago. delivery, as follows: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, 2.10c to 2.25c per 100 pounds, rates.

**Merchant Steel.**—There has been a good volume of buying from the implement and carriage trades, many consumers placing contracts calling for deliveries extending into the first three months of 1904. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c, flat sizes; concave and convex, 2.25c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.35c to 2.45c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; special, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

**Merchant Pipe.**—Buying of pipe of all sizes continues to be of a satisfactory nature, contracts coming in daily from the jobbing and consuming trade. We quote carload lots, mill shipment, random lengths, f. o. b. Chicago, as follows:

| | Steel Pipe. | | Guaranteed Wrought Iron Pipe. | |
|---|---|---|---|---|
| | Black. Percent. | Galv. Percent. | Black. Percent. | Galv. Percent. |
| ⅛ to ⅜ in. inclusive | 66.35 | 56.35 | 63.35 | 53.35 |
| ½ inch | 68.35 | 58.35 | 65.35 | 55.35 |
| ¾ to 6 inches | 73.35 | 63.35 | 71.85 | 61.85 |
| 7 to 12 inches inclusive | 67.35 | 57.35 | 64.35 | 54.35 |

Less than carload lots, 12½ percent advance over above prices.

**Boiler Tubes.**—New business continues of fair proportions and specifications are without diminution. Mills and jobbers report there is no lack of orders, and that the indications point to a satisfactory trade this winter. Prices are without change, mill deliveries, being as follows:

| | L. W. Steel. Percent. | C. C. Iron Percent. |
|---|---|---|
| 1 to 1½ in | 43.35 | 38.35 |
| 1¾ to 2½ in | 55.85 | 35.85 |
| 2¾ to 5 in | 60.85 | 45.85 |
| 6 to 13 in | 55.85 | 35.85 |

For lots direct from warehouse stock:

| | L. W. Steel. Percent. | C. C. Iron Percent. |
|---|---|---|
| 1 to 1½ in | 40 | 35 |
| 1¾ to 2½ in | 50 | 32½ |
| 2¾ to 5 in | 57½ | 42½ |
| 6 to 13 in | 50 | 32½ |

**Cast Iron Pipe.**—The weakness in the pig iron market has brought a drop of $1 a ton in the price of all sizes of pipe. Buying during the week has been fair, though the new business has consisted entirely of orders for small lots. We have revised our quotations, and quote carload lots, f. o. b. Chicago: 4-inch pipe, $30; 6-inch and upwards, $29; gas pipe, $1 a ton higher.

**Rails and Track Supplies.**—The demand for light rails and track supplies continues good from all sources. Heavy rails have fallen off, most of the big roads having covered for their requirements. Prices are firm and without change. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality, rails, $27; 25-pound rails, $32 to $34; 12-pound rails, $39 to $40, with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.20c (out of store, carload lots, 2.25c to 2.35c rates); second quality, 2.10c; track bolts, 3½x¾ with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3c to 3.10c, with usual differentials for other sizes.

**Wire and Wire Nails.**—A large amount of business has been placed both by the hardware and manufacturing trades. The former are specifying heavily on their fall contracts, while the latter have been busy covering for their winter needs. Bale ties are in active demand, mills being in the neighborhood of four weeks behind in the delivery of orders. Wire nails, smooth and barbed wire, have also been moving very freely, one manufacturer placing a contract for nearly 10,000 tons of smooth wire during the week, delivery of same to be made in the remaining months of this year. Some large contracts for wire rope and copper wire have also been placed. Quotations to jobbers, Chicago delivery, follow: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in small lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90; staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; small lots, $2.70. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

**Coke.**—There is no change in the situation, and buying is of a desultory character. Spot Connellsville is quoted

$5.65 to $6.15, Chicago. Virginia and West Virginia grades as follows: New river, $4.65 to $5; Pocahontas, $4.65 to $5; Stonega, $4.85 to $5.25.

**Old Material.**—Scrap of all kinds is weak and demand is of a very limited character. Sales of small lots are occasionally made, but usually of such materials as are required to complete existing contracts. All the mills are out of the market, the majority of them having large stocks in their yards. Prices of pig iron and bars will have to advance before there will be any improvement in scrap. We have revised several of our quotations, and quote dealers' selling prices, gross tons, as follows:

| | |
|---|---|
| Old iron rails | $17 00 to 17 50 |
| Old steel rails (mixed lengths) | 13 50 to 14 00 |
| Old steel rails (long lengths) | 16 00 to 16 50 |
| Relaying rails | 26 50 to 27 00 |
| Old wheels | 17 00 to 17 50 |
| Heavy melting steel | 13 00 to 13 50 |
| Mixed country steel | 11 00 to 11 50 |

The following are selling prices per net ton:

| | |
|---|---|
| No. 1 R. R. wrought | 16 50 to 17 50 |
| No. 2 R. R. wrought | 12 50 to 13 00 |
| Shafting | 14 50 to 15 00 |
| Dealers' forge, No. 1 | 12 00 to 12 50 |
| No. 1 busheling and wrought pipe | 11 00 to 11 25 |
| No. 1 cast | 13 00 to 13 50 |
| Heavy cast (300 pounds and over) | 10 00 to 10 50 |
| Agricultural malleable | 13 00 to 13 50 |
| Iron axles | 18 50 to 19 00 |
| Steel axles | 16 50 to 17 00 |
| Cast borings | 5 00 to 5 50 |
| Mixed borings, etc. | 5 00 to 5 50 |
| Wrought turnings | 10 00 to 10 50 |
| Machine shop turnings | 10 00 to 10 50 |
| Iron axle turnings | 10 75 to 11 25 |
| Steel axle turnings | 10 00 to 10 50 |
| Stove plate and light cast scrap | 10 00 to 10 50 |
| Old iron splice bars | 14 25 to 15 00 |

John T. Wheeler, formerly purchasing agent for the Sargent Co., of Chicago, has accepted a position as traveling salesman for the Field-Evans Iron Co., traveling from its Chicago office.

## CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Sept. 15.

There is some improvement in pig iron buying and orders run rather farther into the future than has been the case recently. Considerable activity in finished material is also noticed.

**Iron Ore.**—The freight market is dull and there is plainly an excess of tonnage. Shippers are easing up on the ore movement and a number of vessels have been sent to the docks, with the probability that they will tie up for the season. The Pittsburg Steamship Co. (Steel Corporation) is involved in a contest with the Masters' and Pilots' Association, owing to the retention of a captain who will not join the union. The company has already ordered 17 boats to the docks and it is expected that crews of others will be paid off as they arrive at Lake Erie ports, in case the mates leave, as the others have done. Apart from this sudden development in the situation, there have been evidences that the ore movement would fall off from this time on. In the Lake Superior region mining operations are slackening and several hundred men have been let out in the past two weeks. This development is in line with the change that is coming over other portions of the iron industry. It is expected that the ore movement will fall considerably short of last year's.

**Pig Iron.**—There is still slack buying of pig iron for immediate use and furnaces are consulting local conditions in quoting prices, thus making it difficult to name any exact basis, though $15.50 at Valley furnace for No. 2 foundry is not uncommon. The refusal of the railroads to reduce the freight rate on iron from the South strengthened the Northern market. Inquiries for material for advance shipment have been heavier and the starting up of some plants consuming foundry iron gives hope for a better trade soon. Malleable pig iron is still in fair demand. Basic iron for fourth quarter delivery becomes a quotable commodity upon the appearance of some inquiries, after months of quietness. It would seem that business for that period will be done on the basis of $15.75 Valley furnace. We quote as follows for Cleveland delivery, save on gray forge, which is at Valley furnace:

| | |
|---|---|
| Bessemer | $16 85 to 17 25 |
| No. 1 Strong Foundry | 16 50 to 16 75 |
| No. 2 Strong Foundry | 15 75 to 16 25 |
| No. 3 Foundry | 15 25 to 15 50 |
| Scotch No. 1 | 16 50 to 16 75 |
| Scotch No. 2 | 15 75 to 16 25 |
| Gray Forge, Valley furnace | 14 00 to 14 25 |
| Lake Superior charcoal | 18 50 to 19 00 |

**Finished Material.**—Business generally has been more brisk and several contracts are in sight and will be closed soon which will involve deliveries covering several months. Bar iron has steadied somewhat, the larger mills, as a rule, holding their prices at 1.50c at the mill. Several good sales for early delivery have been made and other contracts are in sight. Steel bars have been more active and the market has held the agreed price. One contract of upwards of 1,200 tons of structural steel was closed this week and other good sized contracts upon which long time delivery will be required are pending. Specification against old contracts has been heavier and spot buying has been fair. Prices have been firm and the market steady. The basis is unchanged at 1.60c, Pittsburg, with no guarantees against declines. Several orders of 500 to 800 tons of plates have been closed this week and others are pending, together with some long time contracts. In a few instances old orders placed at premium prices and upon which deliveries were not completed, have been waived and new ones at revised prices placed in their stead. There has been sharp competition on plates from Eastern mills selling in this district. The rumor is abroad that the association contemplates a sharp reduction in plate prices. In sheets the smaller mills are still vigorously cutting prices and have been able to keep going while some of the larger mills have been shut down. On sales made through jobbers, the prices for the principal products are unchanged as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12 to 14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

**Old Material.**—Dealers have been engaging in throat cutting competition on staples, especially busheling scrap, and prices are sagging, with very little business being done. The supply is heavy but those who have it are holding for better prices than the ultimate market will stand. We quote nominally, all gross tons, f. o. b. Cleveland:

| | |
|---|---|
| Old iron rails | $19 00 to 20 00 |
| Old steel rails (over 6 feet) | 17 00 to 18 00 |
| Old steel rails (6 feet and under) | 17 00 to 18 00 |
| Old car wheels | 17 00 to 18 00 |
| No. 1 R. R. wrought | 16 50 to 17 50 |
| Mill scrap | 14 00 to 14 50 |
| No. 1 machine cast scrap | 14 50 to 15 00 |
| Iron axles | 22 00 to 23 00 |
| Steel axles | 22 00 to 23 00 |
| Axle turnings | 13 00 to 14 00 |
| Wrought turnings (free from cast) | 12 00 to 13 00 |
| Cast borings | 6 50 to 7 00 |
| Uncut wrought iron boilers | 9 00 to 10 00 |
| Steel boiler plates | 14 00 to 15 00 |
| Grate bars | 10 00 to 11 00 |
| Pipes and flues (clean) | 13 00 to 14 00 |
| Tank iron | 13 00 to 14 00 |
| Hoop and band iron | 10 00 to 12 00 |
| Sheet iron | 8 00 to 9 00 |
| Wrought drillings | 12 00 to 13 00 |
| Malleable iron (railroad) | 15 00 to 16 00 |
| Malleable iron (agricultural) | 13 00 to 14 00 |
| Stove plate | 11 00 to 11 50 |
| Heavy steel | 14 00 to 14 50 |

## CINCINNATI.

Sept. 15.

The coke market has been more active the past week and there is more of a disposition on the part of consumers to provide themselves with supplies for future wants. The increasing reports of inadequate car supply to handle coke shipments has induced some buying and there

is more coke being taken by consumers than for some time. The demand has been sufficient to give the market a steadier tone and for the best brands $3, f. o. b. ovens, is the ruling price, with $3.25 the outside quotation. Some lower prices are being made by handlers of new and untried makes and some large contracts have brought out lower figures but the above quotations are the prevailing prices.

**Pig Iron.**—If there has been any change in the amount of buying the past week it has been in the direction of a decrease rather than an increase. The disposition of buyers is to take only enough for their immediate requirements. There are fewer inquiries covering extended deliveries than last week. It is no secret that foundries are using less iron now than for some time and that there is some complaint of dull business in that direction. There have been some fair sized orders placed, however, notably 5,000 tons of malleable Bessemer at a point in Indiana for extended deliveries on which the price is said to be $16.40 delivered or lower. A sale of 1,250 tons of No. 1 Northern foundry was reported at $15.25, f. o. b. Ironton district, and another sale of 800 tons No. 2 Northern at $14.75 Ironton district. Quite a number of orders of 50 to 500 tons of Southern foundry grades were reported mainly on the basis of $11.50, Birmingham, for No. 2 foundry. It would appear from these sales that $14.75 Ironton and $11.50 Birmingham were minimum figures on ordinary lots, but on one transaction $14.50 Ironton has been reported. In Southern irons the policy of the independent furnaces is to stay within 25 cents per ton of the association schedule. In this way they control the market without the danger of forcing the association furnaces to make another reduction in prices. So far as can be learned the association furnaces are maintaining the $11.75 basis on the small lot business going, though it is intimated Eastern sales are at lower figures. There seems to be just about enough business going to take up the offerings of the independent furnaces and they are not inclined therefore to shade values, especially as the margin of profit has been so materially reduced since the decline to the present basis. The following are the prices current, f. o. b. Cincinnati:

| | |
|---|---|
| Southern Foundry No. 1 | $15 25 to 15 75 |
| Southern Foundry No. 2 | 14 75 to 15 25 |
| Southern Foundry No. 3 | 14 50 to 14 75 |
| Southern Foundry No. 4 | 14 00 to 14 50 |
| Southern Foundry No. 1 soft | 15 25 to 15 75 |
| Southern Foundry No. 2 soft | 14 75 to 15 25 |
| Gray forge | 13 25 to 13 50 |
| Northern Foundry No. 1 | 16 40 to 16 65 |
| Northern Foundry No. 2 | 15 90 to 16 15 |
| Northern Silvery (8% silicon) | 18 65 to 19 15 |
| Southern car wheel iron | 26 25 to 27 25 |

**Finished Material.**—The market is dull and there is an easy tone prevailing for nearly all descriptions. The bar iron market is the most unsettled feature in the list. On car lot orders quotations of 1.55c to 1.60c, f. o. b. Cincinnati, are named. All quotations are easy and small reductions are obtainable on most descriptions, but there is no quotable change in the general market. Steel bars remain at 1.73c base, half extras, with the retail price 1.90c to 2c, for iron and steel out of store. Galvanized sheets are being quoted at 75 and 5 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.05c; No. 27, 2.95c; No. 16, 2.55c; No. 14, 2.45c; No. 12, 2.40c; No. 10, 2.30c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c and 2.25c for base sizes.

In merchant pipe there is no quotable change in prices, but there are evidences of independent mills shading quotations. The demand, however, is fairly good. In tubes the market is reported as firm and active.

MERCHANT PIPE.

(Basing Discounts.)

| | Steel Pipe. | | Guaranteed Wrought Iron Pipe. | |
|---|---|---|---|---|
| | Black. Percent. | Galv. Percent. | Black. Percent. | Galv. Percent. |
| ⅛, ¼, ⅜ inch | 66.7 | 56.7 | 63.7 | 53.7 |
| ½ inch | 68.7 | 58.7 | 65.7 | 55.7 |
| ¾ to 6 inch, inclusive | 73.7 | 63.7 | 70.7 | 60.7 |
| 7 to 12-inch, inclusive | 67.7 | 57.7 | 64.7 | 54.7 |

BOILER TUBES.

| | Steel Percent. | Iron Percent. |
|---|---|---|
| 1 to 1½ inch | 41.2 | 35.2 |
| 1¾ to 2½ inch | 54.2 | 34.2 |
| 2¾ to 5 inch | 59.7 | 44.2 |
| 6 to 13 inch | 54.2 | 34.2 |

**Old Material.**—There is no change in nominal quotations, but the market is still unsettled and dull. We quote:

| | |
|---|---|
| Old No. 1 railroad wrought, net tons | $14 00 to 15 00 |
| Cast machine and foundry, net tons | 12 00 to 12 50 |
| Old iron rails, gross tons | 19 00 to 20 00 |
| Old steel rails, gross tons | 17 00 to 18 00 |
| Old short lengths, gross tons | 14 50 to 15 50 |
| Old iron axles, net tons | 20 00 to 21 00 |
| Stove plate, net tons | 9 00 to 9 50 |
| Wrought turnings, net tons | 11 00 to 11 50 |
| Cast borings, net tons | 6 00 to 6 50 |

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Thomas A. Mack now occupies new office quarters in the Traction Building. They are on the top floor and have refurnished their offices handsomely.

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## NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., Sept. 15.

**Pig Iron.**—Taken as a whole, the local pig iron situation improved a little during the past week. The aggregate tonnage placed was larger than for some weeks, but it was in small lots, with quick shipment invariably requested. A few orders will extend into the new year. Occasionally an inquiry for lots up to 1,000 tons is received, but the final result is either that the buyer decides to wait awhile, or splits his order up into small amounts. The action of a leading Southern interest in making the Birmingham basis for No. 2 Southern foundry on Eastern business $11 for large quantities, and $11.25 for small orders, has been followed by other furnaces fixing their prices accordingly. There is considerable speculation as to whether the reductions apply to seaboard territory only. While it appears to have been made for the East primarily, the view is expressed that the furnaces would not repeat the mistake of a few months ago of discriminating between one section of the country and another, only to be compelled at length to treat all parts alike.

Large buyers of Southern pig continue to hold off, but some of them have intimated that they would place their contracts at about 50 cents less than present quotations. Sales agents take little stock in these assurances, saying that even if the reductions were made buyers would wait. Northern irons form the most unsettling feature of the market. Plenty of talk is heard about furnaces either going out of blast or of curtailing their output. Prices are decidedly irregular. Sales agents either telegraph or write their principals before closing a trade. Reports from foundrymen vary. Some indicate a slight increase in the volume of orders, while others are running slacker. As a rule they have less iron in stock than at any time in years. New York prices are as follows: Northern No. 1 X foundry, $17 to $17.25; No. 2 X, $16.50 to $17; No. 2 plain, $16 to $16.50; Southern No. 1 foundry, $15.75 to $16; No. 2 foundry, $15.25 to $15.50; No. 3 foundry, $14.75 to $15; No. 4 foundry, $14.25 to $14.50.

**Finished Material.**—Makers of structural shapes are awaiting with considerable interest the disposition of orders aggregating 350,000 tons, which are expected to be given out during the present month. The largest single item is about 100,000 tons for the new Blackwell's island bridge, this city, while the remainder is scattered throughout the country, mostly for railroad work. There is a possibility that some of the contracts may be deferred, but not in some time has such good business been in sight. In other finished lines, there is practically nothing of importance to note. The tone in bars is easier, with only a fair tonnage being placed. Sheets continue to be affected by labor troubles, especially in this city, but in the main conditions are thought favorable. In plates, dullness is the rule, with some mills very anxious for work. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.79c to 1.86c; flange, 1.90c to 2.10c; firebox, 2.10c to 2.20c; refined iron bars, 1.61c to 1.80c; soft steel bars, 1.70c to 1.75c; steel sheets,

in carloads. New York, No. 28, black, 2.90c to 3.05c; galvanized, 75 and 2½ off.

### PHILADELPHIA.

Sept 15.

Prices continue to weaken, particularly in pig iron, and the tendency seems to be toward a lower level. There is great pressure to sell iron, and Southern and Northern furnaces are competing more sharply for the business going. Consumption is still on an enormous scale—approximately 19,000,000 tons a year—and the change in market conditions seems to be due more to the large active capacity than to any material falling off in consumption. Foundry operations have been somewhat curtailed by labor troubles and the outlook is less promising.

**Pig Iron.**—There is a good deal of irregularity in prices, with the situation largely in the buyer's favor. Some Pennsylvania furnaces, with their high costs for labor and raw material, will soon be compelled to go out of blast, if the decline should go further. There is a lack of confidence in the ability of producers to maintain present prices and therefore buying is from week to week or from month to month. There has been some decline in the past week. Southern iron has sold on the basis of $11, Birmingham, for No. 2. We quote delivered prices as follows: No. 1 foundry, standard brands, $17.50 to $18; No. 2 X foundry, $16 to $17; No. 2 foundry plain, $15.25 to $16.75; gray forge, standard brands, $15 to $15.50; gray forge, ordinary, $14.50 to $14.75; basic, $15.25 to $15.50;

**Steel.**—There is scarcely any demand beyond an occasional lot of 300 to 400 tons. The lowering price for Bessemer and basic pig leads to the expectation of a lower basis for steel. Nominal prices are $28 to $28.50 for open-hearth and $28.25 for Bessemer.

**Finished Material.**—Prices are fairly maintained, to all outward appearance, but there is little doing, buyers expecting to buy to better advantage later. Plate mills are going out eagerly for business and there are reports that the pool price has been shaded on desirable contracts. We quote tank plates at 1.75c in carload lots for ¼-inch and thicker. Bar iron is weak and at 1.60c for refined in carload lots shows more activity than steel, which at the agreed basis is 1.73½c delivered. Larger sales of bar iron are made at $1 to $2 a ton below the carload basis. Structural material is dull at unchanged prices. There is some promise of good railroad demand in the near future. We quote angles at 1.75c to 1.90c; beams and channels, 1.73½c for 15-inch and over.

**Old Material.**—There is no improvement, as consumers show very little disposition to take hold, even though prices would be made to accord with their ideas. We quote nominal bids and offers as follows: Old steel rails, $16.50 to $17; miscellaneous heavy steel scrap, $16.25 to $16.50; low phosphorus scrap, $24 to $25; old steel axles, $18 to $19; old iron axles, nominal, $20 to $21; old iron rails, nominal, $19 to $20; old car wheels, $18 to $19; choice scrap, railroad, No. 1 wrought, $16.50 to $17.50; country scrap, $14 to $15; machinery cast, $15 to $16; No. 2 light scrap (forge), $15 to $16; No. 2 light scrap (ordinary), $11 to $12; wrought turnings, $11.75 to $12.25; wrought turnings, choice heavy, $12.50 to $13; cast borings, $7.50 to $8.25; stove plate, $11.50 to $12.

### BIRMINGHAM, ALA.

Sept. 15

There has been a much better buying movement the past week than the makers of pig iron in the South have experienced for some months. Notwithstanding the many rumors as to still further reductions in price, a good volume of business has been done at $11.75 for No. 2 foundry. One interest came into the market during the week for its immediate needs, using numerous arguments, but apparently without success, to induce a shading of current quotations. An order was placed for part of their needs and by the time shipments could begin the order was duplicated. Such buying as has prevailed for some weeks has been almost altogether for prompt shipment, buyers evidently fearing to take chances on further declines. With present prices and with present freight rates, it is generally conceded that many furnaces in the South are very near the cost mark, as the average grade of their output will hardly show as high as No. 3 foundry from month to month. Concerning the reports of large stocks of iron on furnace yards, it would appear that on Sept. 1 there were less than ten days' supply available at the present rate of consumption, although production is still in excess of the needs, based on the demands during the summer months.

Coke and coal have shown very little fluctuation for the past thirty days, the former varying from $3.50 to $4.25 at the ovens for foundry use, while coal is bringing $1.35 to $1.50 for steam purposes.

It is announced that the Alabama Tube & Iron Co. has perfected a reorganization and will operate the plant at Helena under the name of Alabama Tube & Horseshoe Co. Additional capital is reported to have been added by Pittsburg parties and a line of horseshoes will be manufactured in addition to tubing.

## The Metal Market.

### NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Sept 8.

**Pig Tin.**—The market during the week has been dull, but very irregular, with prices inclined to be easier. Buyers are only in the market when they have pressing requirements to meet, and do not take hold even when there are some wide fluctuations in their favor. Uncertainty as to the outlook is the reason they assign. In London during the week the market has been fairly strong, especially futures, which were in fairly good demand. Closing prices at the Metal Exchange today were as follows: Spot and September, 27.15c to 27.50c; October, 26.50c to 26.75c. London closed today as follows: Spot, £121 2s 6d; futures, £120 12s 6d. Arrivals at Atlantic ports for the month to date aggregate 1,247 tons, with 1,420 tons afloat.

**Copper.**—Although the "official" prices remain unchanged, the scarcity of new business has caused the shading of them in the open market from ⅛c to ¼c, casting being especially vulnerable. Unless the situation improves in a short time, good judges of the market look for a decline in prices. The demand at present is the slowest it has been in weeks. In London, the market has suffered a sharp setback, general conditions abroad being even more unsatisfactory than here. Closing prices at the Metal Exchange today were as follows: Lake, 13¾c to 13⅞c; electrolytic, 13⅝c to 13¾c; casting, 13⅜c to 13½c. London's closings today follow: Spot, £56 12s 6d; futures, £56 7s 6d. Exports for the month to date amount to 4,103 tons, against 4,969 tons for the same period last year.

**Lead.**—Scarcity of spot stocks is still acute, and prices now are at the highest level, being 4.40c. Both St. Louis and London are stronger, selling at 4.45c and £11 5s respectively.

**Spelter.**—Is firm and unchanged at 6c. St. Louis is stronger at 5.75c. London is higher at £21 5s.

**Antimony.**—Cookson's is 7¼c, Hallett's 6⅜c, and outside brands 6c to 6¼c.

**Quicksilver.**—Still quoted at $47.50 per flask of 76½ pounds in lots of 100 flasks. London unchanged at £8 2s 6d.

**Nickel.**—Is selling at 40c to 47c for large lots down to a ton, and 50c and 60c for smaller quantities.

### CHICAGO MARKET.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, Sept. 15.

Buying of metals continues light in this market, due in large measure to the high prices prevailing. Melters are purchasing only for immediate requirements, efforts of jobbers to induce season contracting having signally failed. Pig lead and spelters have advanced in price as a result of a shortage in these materials, though demand for both products is of small proportions. We have revised our quotations, and quote Lake copper, carloads, 13⅜c to 13⅝c; casting, 13¼c to 13⅜c. Pig tin, carload, 27½c, lesser lots, 27¾c. Pig lead, 4.50c in 50 to 100-ton lots, and 4⅜c to 5c in small quantities; spelter, 5.70c in carload lots, and 6c to 6¼c in small quantities; sheet zinc, 6¼c; antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's. We quote old metals as follows: Copper wire, 11⅛c; heavy copper, 11⅛c; light copper, 10¾c; heavy red brass, 11¼c; light brass, 10¼c; red turnings, 9¼c; yellow

## NEW PRESIDENT OF THE IRON MOLDERS' UNION.

On Sept. 1 Joseph F. Valentine became president of the Iron Molders' Union of North America, succeeding Martin Fox, whose resignation was referred to in these columns a few weeks since. Mr. Valentine has been first vice president of the union for the past 13 years and has had in hand some of its most important work. He was born in Baltimore, Md., in 1857, and served his apprenticeship with the Bartlett & Hayward Co., of that city. After becoming a journeyman he went to San Francisco and worked for 10 years in the shop of the Steiger & Kerr Foundry Co. He became president of the local union of iron molders and was active in the Union Iron Works strike of 1890. Mr. Valentine was elected first vice president of the Iron Molders' Union at the district convention in July, 1890, and was re-elected successively at the Chicago convention of 1895, at Indianapolis in 1899, and at

JOSEPH F VALENTINE.

Toronto in 1902. He has been indefatigable and aggressive in his efforts for the union and has had an active part in shaping its policy in recent years.

### La Belle Iron Works.

The annual meeting of the stockholders of the LaBelle Iron Works, Steubenville, O., was held at Wheeling, W. Va., on Tuesday, Sept. 8. It was decided to drop the word "the" from the title of the corporation so as to read LaBelle Iron Works, and the board of directors was increased from seven to eleven members. The meeting was attended by about 150 stockholders of the 525 on the books of the company. Of the 70,000 shares outstanding, representing a capitalization of $7,000,000, 53,156 were represented. The election of the board of directors resulted in the choice of the following: C. O. Robinson, A. H. Woodward, H. C. Franzheim, J. E. Wright, D. J. St. Clair, C. W. Bray, George Greer, A. J. Clark, E. W. Mudge, W. S. Foltz and A. S. List. After the meeting the stockholders boarded a special train for Steubenville to inspect the company's plant. Eight of the nine open-hearth furnaces were in operation and the ninth furnace will be completed shortly. Five of the continuous mills were on in full and two of the skelp mills are completed and will commence operations soon. New construction in the past two years has cost the company about $4,700,000 and has resulted in the erection of one of the most modern plants in the Wheeling district.

By the recent incorporation of the DuBois Southwestern Railroad Co., the Goodyear interests of Buffalo propose to extend the Buffalo & Susquehanna Railroad 50 miles southward through Pennsylvania to mining properties recently acquired. Coal and coke will be hauled to the Buffalo & Susquehanna plant at Buffalo.

## FORT WAYNE IRON & STEEL CO.

Mention has been made in previous issues of *The Iron Trade Review* of the erection of a new plant at Fort Wayne, Ind., by the American Rolling Mill Corporation, of Chicago, and the dismantling of the company's plant at Muskegon, Mich. It is expected that this plant will be in operation by Nov. 1. Announcement has recently been made of the incorporation of a new company to operate these works, with a capital stock of $175,000, to be known as the Fort Wayne Iron & Steel Co., the American Rolling Mill Corporation retaining one-half of the stock. Headquarters will be established at Fort Wayne, with the sales office in The Rookery, Chicago. The company will manufacture bar iron and kindred products, and have a total daily capacity of 250 tons, divided as follows: The muck mill, 100 tons; the bar and guide mill, 150 tons. The plant will consist of a finishing mill, 142x308 feet; muck mill, 160x 160 feet; machine and blacksmith shop, 40x50 feet; gas producer building and coal bins, 40x68 feet, and will occupy a tract of land 10 acres in extent lying between the Pennsylvania and the Lake Erie and Western railroads, and on the Fort Wayne Belt Railway. A plant for the manufacture of track bolts, spikes, nuts, rivets, washers, etc., will be added later.

The muck mill will be equipped with one three-high 20-inch train, having two stands of rolls driven by a 28x60-inch Corliss engine, and gas fired puddling, scrap and busheling furnaces. Two 250-horsepower and one 125-horsepower Hyde waste heat boilers will be used. This mill is to be used for rolling puddle bar, fagot bar, billets and slabs, to be worked over on finishing mills. The 18-inch bar mill will have two three-door gas furnaces and three stands of rolls driven by a 24x48-inch Corliss engine. This mill is to be used for rolling heavy bars, rounds and squares. The 9-inch guide mill will have two four-door gas furnaces and a Belgian train, 12-inch roughing and 9-inch finishing of four stands of rolls driven by a 22x30-inch Corliss piston valve engine. The officers are as follows: President, Edward F. Yarnelle, Ft. Wayne; vice president, Walter I. Moody, Chicago; treasurer, John W. Sale, Ft. Wayne; secretary, Howell C. Rockhill, Ft. Wayne; general manager, Chas. H. Rawlins, Ft. Wayne.

## TRADE PUBLICATIONS.

The Southern Stove Works, of Evansville, Ind., has a catalogue and price list, No. 52, for the season of 1903-4. The pamphlet is standard size, 6x9 inches, and contains 144 well illustrated pages.

A small pamphlet from H. L. F. Trebert & Co., of Rochester, N. Y., describes gasoline motors and transmission gears for automobiles and launches.

"Nuttall Products" is the title of a tastefully designed circular treating of gears, trolleys, sleet cutters, etc. The engravings are especially admirable.

Carey's magnesia flexible cement roofing is the topic of two publications of the Philip Carey Mfg. Co., of Lockland, O. The use and application of the roofing, pipe and boiler coverings, asbestos and asphalt materials, paints, etc., are discussed.

Curculars of safety gates and locks for elevators and hatches are received from the Cleveland Safety Gate Co., of Cleveland, A new catalogue is in course of preparation.

Advance sheets of the 1904 catalogue of the Blaisdell Machinery Co., of Bradford, Pa., briefly describes the line of air and gas compressors.

The Newton Machine Tool Works, of Philadelphia, has sent out Catalogue No. 36. It is 6x9 inches and comprises 236 pages, illustrating specialties in metal working tools.

A recent folder of Geo. G. Blackwell, Sons & Co., Ltd., of Liverpool, Eng., gives a number of views indicating the extent of its operations in mining and transporting its "Lion" brand of fluorspar. The company operates the largest group of fluorspar mines in the world, supplying at present at the rate of 25,000 tons a year. The halftone views include pictures of the mines, of the steam carts used in transporting spar from mines to railroad distributing points, of railroad depots from which shipments are made, and of a shipping port, showing the loading facilities for foreign shipments.

## COURSES IN THE CARNEGIE TECHNICAL SCHOOL.

At a meeting of the board of trustees of the Carnegie Institute held at Pittsburg last week the character and scope of the new technical school endowed by Andrew Carnegie and to be built in Pittsburg was outlined. The school has been endowed with $2,000,000 worth of bonds of the United States Steel Corporation, which will net an annual income of $100,000. The curriculum outlined will be of much benefit to young men engaged in the plants in the Pittsburg district, inasmuch as a large number of the courses cover iron and steel operations and foundry work. The report of the committee on plan and scope contains the following:

We have, therefore, prepared courses of instruction to do the following:

First—Courses that will impart skill and intelligence to young men so as to increase their earning capacity, lift their standard of labor from the unskilled to the skilled and raise them socially to a higher level.

Second—Courses that will give to those of greater intelligence and natural ability a more thorough course fitting them, after proper experience, to direct the skilled labor and to fill the great class of middle positions below tne engineer and genal manager, but above the skilled mechanic.

Third—Courses that will give to young men and young women who have some taste and ability for art, a training in the application of art industry, enabling them to turn such talent to the best advantage.

Fourth—Courses that seek to give to the constantly increasing number of women who must earn their living by their own labor the same opportunity that is given to men to increase their skill, their technical knowledge and their judgment and intelligence, and thus lift their work to a higher standard, increase their opportunities for employment and broaden their field of usefulness.

Your committee recommends that the Carnegie Technical School shall be sub-divided as follows:

1—School of science and technology (for young men).
2—School for mechanics and artisans (for young men).
3—Schoof of fine and applied arts (for both sexes).
4—Women's industrial school (for young women).

TECHNICAL SCHOOL OF APPLIED MECHANICS.

Day course—Three years, nine months each; entrance age, 16 years or over:

1—Steel manufacture and machinery.
2—Structural steel design and construction.
4—Applied electricity.
5—Power generation and transmission.
6—Glass, ceramics and clay working.
7—Gas manufacture and petroleum products.

Night courses—Two or three years, six months each, 3 nights a week:

1—Mechanical drawing and machine design.
2—Architectural drawing and design.
3—Bridge and structural steel drawing and design.
4—Applied chemistry.
5—Applied electricity.
6—Steam engineering.
7—Practical mechanics.
8—Strength of material and building construction.

SCHOOL FOR MECHANICS AND ARTISANS.

Day trade classes, six months each, eight hours each day; age of entrance, 18 to 25:

1—Machine forging and blacksmithing.
2—Pattern making.
3—Molding and foundry work.
4—Machinist work.
5—Plumbing.
6—Electric wiring.
7—Masonry and bricklaying and fireproofing.
8—Carpentry and cottage building.
9—House, sign and fresco painting.

Night classes, two years, six months each, three times a week:

1—Mechanical work.
2—Foundry work.
3—Pattern making.
4—Blacksmithing and forging.
5—Furnace and masonry and lining.
6—Templet making for structural steel.
7—Steamfitting and hot water heating.
8—Sheet metal and cornice work.
9—Plumbing work.
10—Masonry and bricklaying.
11—Electric wiring.
12—Carpentry and cottage building.
13—House, sign and fresco painting.
14—House smithing and iron working.

Technical popular lectures free to the public, weekly, on industrial topics, local industries, science and achievement.

Note—All evening classes to meet three times a week for two hours and six months in the year. Applicant must be 17 years of age.

School of domestic science and art:
Technical courses.
Industrial courses (for women).
School of fine and applied arts:
Technical courses.
Industrial courses (for men and women).

## PERSONAL.

E. E. Robinson, who has been superintendent of the open-hearth furnaces being constructed by the Alabama Steel & Wire Co., in Gadsden, Ala., has resigned his position to accept a similar one with the United States Steel Corporation.

Franklin Farrell, Jr., the son of a millionaire and a recent graduate of Yale, has entered his father's foundry at Derby, Conn., for the purpose of learning the trade.

Walther Gratzel and J. Dos, who are connected with large German coal and steel properties of Count Donnersmarck, are now in this country tor the purpose of making an inspection of some of the principal coal mines and steel plants. They have visited Philadelphia and Pittsburg, and will also visit the Cleveland and Birmingham districts.

A. G. Hammerberg has resigned his position as head of the engineering department of the Youngstown, O., Iron Sheet & Tube Co., to go with the Seattle Iron & Steel Co., Seattle, Wash. He will take charge of the engineering work for the new open-hearth steel plant and rolling mill which are to be constructed by the Seattle Iron & Steel Co.

Garry LeVan, formerly superintendent of the Haselton stack of the Republic Iron & Steel Co., and more lately superintendent of the Atlantic stack at New Castle, Pa., has been appointed superintendent of the company's three stacks at Thomas, Ala. Robert Coates, of Youngstown, O., superintendent of the Hall furnace at Sharon, will hereafter have charge of both the Hall and Atlantic furnaces.

On his return to Sharon from a 6 months' tour abroad, John Stevenson, late vice president and general manager of the Sharon Steel Co., was welcomed by 200 representative citizens. A number of eulogistic addresses were delivered.

Henry G. Hay, of Cheyenne, Wyo., state treasurer and president of the Stock Growers' Bank, has accepted the position of assistant treasurer of the United States Steel Corporation with offices in New York.

President Frank J. Hearne, of the Colorado Fuel & Iron Co., is thus quoted in Denver dispatches as to his policy: "I have no favorites to bring here to supplant men now in the employ of the Colorado Fuel & Iron Co. I have come to make this State my home, and I want to be considered hereafter as a Coloradoan. There will be no revolution in the management; I am not coming to tear down, revolutionize, or even to build up to any alarming extent. I expect to carry out the policy inaugurated by my predecessors. I shall buy a residence in Denver as soon as I can find one to my liking, and shall stay here permanently."

James H. Nutt, of the Republic Iron & Steel Co., with headquarters at Youngstown, O., has been elected secretary of the Independent Sheet Manufacturers' Association. It will be his duty to arrange all wage matters with the Amalgamated Association and another effort will be made to have the limit of output removed. The headquarters of the association will be at Youngstown, O.

# THE IRON TRADE REVIEW

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## CHANGING CONDITIONS AND THE LABOR TRUST.

When wage readjustments come, as they will inevitably, the labor unions will have on their hands the greatest problem with which they have ever dealt. It is one thing for the union leaders to bring to their way of thinking manufacturers whose shops are crowded with business and whose mail is largely the urgings of impatient customers. Quite another task will these leaders find it, to convince the vast army of new recruits to unionism that there is any other function for union officers than to enforce advances or any other road for wages to travel than the ascending road. The unleavened lump of new material in the unions cannot possibly be trained in restraint and conservatism before the time will come for the reaction. Clarence S. Darrow attorney for the striking anthracite miners, in a recent address showed clear insight into the dangers ahead, and his words are worth repeating:

> The great growth of trade unionism in the last few years has taken into its body large numbers of men who were not familiar with its principles or its value, whose one desire has been to better their condition; who know not the understanding of affairs to recognize the relation that trade unionism bears to general progress, and who therefore have narrow views as to its management, control and use. In addition to this, large numbers of workingmen have joined trade unions for the purpose of buying their peace with their fellow workingmen. This large body of trade unionists are not really trade unionists at heart, are not interested in its movements, do not understand it, and do not care for it.
>
> The great growth of trades unionism has caused its greatest peril. While it was remote from the masses of men it was given little attention. But as it has grown strong and aggressive, reactionary force must be expected to be called into operation to defeat its purposes and its ends. But still more dangerous to trades unionism is the modern tendency of the bodies themselves to ignore political and ethical questions of industry and government and direct their attention entirely to the betterment of wages and to the more immediate affairs that influence man.
>
> When all is said and done the power of public opinion is the one controlling power in the world. A sufficient public opinion will preserve trade unionism. A strong enough hostile public opinion will destroy it. Trade unionism has fought its long battles and won its well-earned victories because it deserved to have the public on its side; because it stood for something more than individual selfishness; because it really meant the upbuilding of the race. If it should lose its moral forces and descend to pure selfishness it is bound to fall to pieces.

Just as the manufacturing trusts that have been violating sound finance in their organization or sound economics in their manufacturing and selling policies must suffer for their mistakes, so surely will the promotors of the labor trust find that there is a reckoning for their attempts to make headway by a denial of the natural rights of others. Coercion, the boycott, and the intimidation of workmen and their dependent wives and children, to compel every workman to come under the rule of the trust, are weapons that cannot win permanent success in establishing the union as a dominant force in our industrial life. All progress made by violent means is only a temporary and seeming advance, as will appear more plainly when the coherence of the unions will have to be something more than victories gained by the stand-and-deliver argument of the strike.

When there are two men for one job, the real dependence of the unions, their chief asset, will be those changes which they have been able to secure in friendly, conciliatory conference with employers—such as have appealed to reason and the sense of justice. Other so-called advantages, which are now talked about by labor leaders as though secure for all time, will disappear under the operation of the same class of causes that brought them—the necessities of the industrial situation. The difference will be that then the necessity will be the workmen's rather than the employer's.

## AN OLD SECRET RETOLD.

Again the secret is out. A book purporting to give the "inside history" of the Carnegie Steel Co. is quoted from in the newspapers and gain is made out of the publication of private correspondence, to which some trusted employe had access. One paper, referring to a statement by Mr. Schwab, in a letter printed in the book, that steel rails could be produced at $12 at a time they were costing the consumer $28, sagely observes: "Here, indeed, it would appear, has been forged a weapon which may have deadly effect when placed in the hands of the opponents of the 'tariff protected trusts.' One may read of a division of profits running as high as 88 percent to the members of the Carnegie association."

That "weapon" was forged long ago. It has been reforged into various shapes sundry and divers times. Those who have made use of it have never explained why this beneficent tariff has been so partial. Why were there not more Carnegie Steel Co. successes if it was all the gift of the tariff? Why should there ever be a steel company receivership, if the tariff has been so generous? There have been receiverships, moreover, in the steel rail trade, which is so often cited as a conspicuous example of tariff-coined profits. We recall, too, the annual report of an important Western steel company manufacturing steel rails—and it was not so many years ago—in which there was not only an absence of handsome protective tariff profits, but the

recital of causes that had brought a heavy loss for the year.

Time and again the question of profits in iron and steel manufacture has been before the American people, and those who have taken the pains to investigate have found the way traveled by the American iron trade from its infancy to its present eminence strewn with the wreckage of unsuccessful and bankrupt concerns—of rust-eaten and abandoned blast furnaces and rolling mills. What makes the history of the Carnegie Steel Co. so interesting a theme that a book is devoted to it, when there have been hundreds of iron mining, blast furnace and steel works companies striving in the same race in the self-same years covered by the Carnegie narrative? All came up under the same tariff, as they have come up under the same sunshine and rain and the same succession of summer and winter.

The "secret" as to costs of iron and steel making has been brought out in campaign after campaign, aided and abetted from England, to persuade the American people to punish the iron and steel industry for its occasional periods of prosperity. Yet strangely only a comparatively small number of the 80 millions of our people have been willing to invest in this bonanza industry. Thousands of them have even been lured by the uncertainties of holes in the ground leading into rock formations whose wealth in mineral might prove to be absolutely nil, and this right in the face of the millions awaiting them on top of the ground for the mere building and operating of plant for the manufacture of iron and steel.

One is led to wonder why time and money should be spent in conning the devious pages of this Carneigie book, to learn the secret of the company's accumulated millions—incidentally invested in plant giving work to tens of thousands of men—when so many philanthropic journalists are openly publishing this secret of the benevolent tariff.

## Obituary.

The death is announced of Robert De Wendel, head of the famous iron and steel works at Hayange, in Lorraine. He was well known in the iron industry of Europe and on the visit of the Iron and Steel Institute to the Paris Exposition in September, 1900, was president of the reception committee. He had been a member of the institute since 1872. M. De-Wendel came of a family of manufacturers. Prominent also in affairs of state. His father occupied a seat in the Legislative Assembly under the Second Empire, while his elder brother has recently been elected a member of the German Reichstag. Robert de Wendel commenced his business career in 1867, when he entered the Hayange Works with a view to taking charge of the commercial department of the concern. On the death of his father in 1870, Robert de Wendel became manager of the Hayange Works, and in 1879 helped to found the Joeuf Works.

Charles M. Gummer, vice president of the Gem City Stove Co., Dayton, Ohio, died suddenly, Sept. 6, aged 46 years.

Charles Walter Richards, who had been prominently identified with the stove manufacturing interests of New York, died at his home in Brooklyn, N. Y., Sept. 5. He was the New York manager for the Syracuse Stove Co., and had organized the Harvest Stove Co., of South Pittsburg, Tenn. He was born in Bergennes, Vt., 51 years ago.

James Matthews, master mechanic of the Bessemer plant of the Republic Iron & Steel Co., Youngstown, O., died last week from the result of burns received in an explosion at the plant. He was 53 years of age and was assistant master mechanic of the Ohio works of the Carnegie Steel Co. before accepting a position with the Republic Iron & Steel Co.

Frank H. Baldwin, superintendent of the Anschutz-Bradberry plant of the Pittsburg Stove & Range Co., of Pittsburg, Pa., died at his home in Pittsburg last week at the age of 32 years. He was the son of Samuel R. Baldwin, one of the pioneer stove manufacturers of the United States.

Bronson B. Tuttle, a retired manufacturer of Naugatuck, Conn., died Sept. 14 of apoplexy. As the senior member of the firm of Tuttle & Whittemore (now the Naugatuck Iron Works) he had manufacturing interests in Naugatuck, Troy, New York, Cleveland, Indianapolis and Chicago. He was born in Naugatuck in 1835.

## CASE HARDENING OF IRON.

At the 11th annual convention of the National Railroad Master Blacksmiths' Association held at Buffalo, Aug. 18-20, the following report on "Case-Hardening" was presented by A. W. McCaslin:

The best material to be case-hardened for guides, links, link-lifters, blocks and saddles, eccentric-rod jaws and all motion work is No. 1 fibrous hammered iron. We do not think it advisable to use granular iron for any purpose where case-hardening is required. To do so would greatly depreciate its reliability, owing to the shortness of its initial structure. Nor would we recommend merchant bar iron with its rawness, lack of density, and too great percentage of slag.

Guides made of good hammered iron should remain in the carbon after becoming red hot, from 20 to 24 hours. A carbon penetration of $^{3}/_{16}$ in., or even ¼ in., is none too deep for them. Lighter articles such as links and all motion work will have the proper penetration of carbon ($^{5}/_{32}$ in.) after being held at the right temperature for from 15 to 16 hours. The proper temperature for case-hardening runs from 1,550 to 1,700 deg. F.

There have been misleading statements made as to the effect case-hardening has on the tensile strength of iron, some claiming it loses 10 percent, others saying 33⅓ percent. A test piece I have brought with me having an area of ½ sq. in. was subjected to red heat for five hours, and shows a carbon penetration of $^{1}/_{32}$ in., giving 82 percent of area not hardened and 18 percent hardened. The tensile strength of this piece was 55,330 lb. per sq. in. The tensile strength of the same iron not hardened was 54,420 lbs. per sq. in., which gives a percentage of 1⅝ in favor of the hardened iron. Another piece with 1 sq. in. area was subjected to red heat for 10 hours and shows a carbon penetration of $^{1}/_{16}$ in., giving 76.5 percent not hardened and 23.5 percent hardened. The tensile strength of this piece was 46,325 lb. The same iron not hardened had a tensile strength of 44,000 lb., leaving 5 percent in favor of hardened iron.

A test of two other pieces was identical with test No. 2 as far as time subject to red heat, penetration, area of hardened and unhardened parts are concerned, but they were quenched immediately in cold water. The average tensile strength of these two pieces was 54,185 lb. per sq. in. Two similar pieces not hardened had a tensile strength of 48,900 lb., leaving $9^{285}/_{100}$ percent in tensile strength in favor of hardened iron. This also shows about 4¾ percent in favor of quenching at the first heat.

Two pieces were subjected to red heat for 15 hours, giving a carbon penetration of $^{3}/_{32}$ in., 66 percent of area not hardened and 34 percent hardened. Average tensile strength 53,405 lb. Average strength of similar pieces not hardened was 48,900 lb., leaving 8½ percent in favor of hardened iron.

The above four tests seem conclusive that case-hardened iron will show a greater tensile strength than raw iron. Case-hardening iron stiffens it and adds to its torsional, shearing and bending strength equally as much as to its tensile strength.

Three test pieces of common merchant bar iron were all heated together for 12 hours for the purpose of testing the virtue of annealed case-hardened iron. One was quenched when taken from the furnace. A second was allowed to cool in the atmosphere, reheated and quenched. The third was quenched when taken from the fire, reheated and annealed in dry ashes, heated again and quenched, showing no depreciation in penetration or degree of hardness, but the hardened part has been refined very perceptibly. This would indicate that iron case-hardened to a considerable depth, and having passed through service that necessitated its re-machining, could be annealed, and after being trued up could be reheated to a low red and quenched, thus avoiding the necessity of adding more carbon. At the same time this would lessen the danger of the iron springing or winding, which we frequently have to contend with in case-hardening, as it requires a higher degree of temperature to qualify iron for absorbing carbon than it does to harden it in water after the carbon is absorbed.

The meeting of the New England Foundrymen's Association, at Boston, Wednesday afternoon and evening, Sept. 9, was attended by about 40 members. The following firms were elected to membership: Holyoke Machine Co., Holyoke, Mass.; Rhode Island Malleable Iron Co., Hills Grove, R. I.; James Stewart & Co., South Boston, Mass. The address was by Wm. R. Viall, of the Brown & Sharpe Mfg. Co., Providence, R. I.

# The Labor Situation.

### BALTIMORE METAL TRADES ASSOCIATION.

The Baltimore Metal Trades Association has been organized. There are in the association 18 firms, representing 600 employes. John Quitman Lovell, of the Baltimore Shipbuilding & Dry Dock Co., is president; Albert W. Adt, of the John B. Adt Machine Works, vice president; James L. Murrill, of Murrill & Keizer, treasurer, and F. S. Brown, of F. S. & G. L. Brown, secretary. The following firms are members: John B. Adt, Baltimore Dry Dock Co., Baltimore Machine & Elevator Works, F. S. & G. L. Brown, James Bates' Sons, Crook-Horner Co., Detrick & Harvey Machine Works, Flynn-Emerich Co., William Hollingsworth, Murrill & Keizer Co., John N. Marquette, Ott. Mergenthaler Co., John R. Mitchell, Maryland Foundry & Machine Co., Sinclair-Scott Co., Stevenson & Co., B. F. Starr & Co. and Charles Zies.

President Lovell is reported as follows: "One of the things we intend to do will particularly work for the benefit of the men. We will establish a card system by which every employer will know the record of every man employed by any firm in our line of industry. On a systematically arranged card each man's name will appear, with his record, personal ability, value to his employer and such other information as may be desirable. When for any reason a man loses a position in one place and applies to another, his card, in possession of the association, immediately gives the prospective employer all necessary information concerning him. Later we will give each man a card for himself, presentation of which will answer the same purpose wherever he may go. Another feature of the card system is that it will be far-reaching in securing positions for men. Suppose John Jones is sick and needs a change of climate, or suppose he simply wants to move on general principles. He notifies our headquarters, we immediately open correspondence with the metal trades association of that place, and if there is a vacancy Jones gets it. If John Smith of that place wants to come to Baltimore, he and John Jones make a trade through our card system. If for any reason a number of men are out of work, the cards of such men will be kept convenient, and the first vacancy is filled out of these cards. The whole plan is one that will work favorably in bringing employers and employes into closer and more satisfactory relations."

### THE SAM PARKS UNION EXPELLED.

President Buchanan, of the International Association of Bridge and Structural Iron Workers, has annulled the charter of New York Local No. 2, of the Housesmiths' and Bridgemen's Union, of which Sam Parks, recently convicted of accepting bribes, is the virtual head, and has suspended the organization. In his letter to the union Mr. Buchanan says the agreement of May, 1903, between the employers' association and the international organization had been broken and violated by the action of the New York organization, which ordered a strike against members of the association, disastrous alike to the local union and to the interests of the international association, since the contract with the two bodies provides that misunderstandings and disputes between employers and employes shall be submitted to arbitration without strikes.

On this point President Buchanan says: "Such a total disregard of your contract obligations not only reflects upon the standing of your own local, but endangers the international organization, is against the principles of trade unionism, and is damaging to the rank and its officers." President Buchanan then says that the officers of the local have been guilty of maliciously false statements against the international officers, and its business agent has violated the constitution of the local by assuming control of strikes when they should properly be controlled by the legislative board of the local. Then, he says, the business agent of the local has been allowed to assume the authority of discharging members of the organization who were not in sympathy with him.

### SETTLEMENT WITH CINCINNATI MOLDERS.

The differences between Cincinnati foundrymen and molders, which were under consideration for some time, were settled on the basis of 20 cents a day increase in the minimum and a straight advance of 20 cents to all day workers. The Cincinnati foundrymen were strongly opposed to the 9-hour day asked by the molders and preferred an advance in wages with the retention of the 10-hour day.

### PUDDLING RATE FALLS TO $6.

The bi-monthly adjustment of wages for puddlers and rollers affiliated with the Amalgamated Association has resulted in a reduction of 25 cents per ton for the puddlers and 2 percent for the finishers on account of the falling off in the selling price of bar iron. The sales sheets for the months of July and August showed an average of 1.60c, and the low prices at which orders have been accepted during the past two weeks will no doubt result in a further reduction at the next bi-monthly settlement. During the months of September and October the puddlers will receive $6 per ton on a 1.6 card rate, whereas they received $6.25 per ton during July and August on a 1.7 card rate.

### LABOR NOTES.

Three hundred men employed in the setting-up shops in the freight department of the Jeffersonville, Ind., branch of the American Car & Foundry Co. have gone on a strike for an increase in wages of 25 per cent and it is stated that if the demand is not granted there will be a sympathetic strike and all the employes of the plant, numbering 1,500 men, will go out. Local Manager Ingram, of the car company, says that the company is willing to adopt a sliding scale of wages, according to the efficiency of the workmen. Mr. Ingram adds that freight car work has been very scarce and to keep the car builders employed the company has just transferred a contract for 500 cars for the Cotton Belt line to the Jeffersonville plant, and if there was any assurance that the work would not be interfered with by strikes an additional 500 would be sent to Jeffersonville.

The power of Sam Parks, the notorious walking delegate of New York, seems to be on the wane. His attempt to cause a general sympathetic strike on all contracts of the Geo. A. Fuller Co. in New York has failed, and his Local Housesmiths' Union in New York has been repudiated by the National organization.

The Weimer Machine Works Co.'s foundry at Lebanon, Pa., is again in full operation with non-union molders. Over four months ago the company's molders made demands which were refused, and the molders, with the exception of four, went on strike. The company claim that it gets better work and more per molder since it has a non-union force than when it ran an open shop.

The National Metal Trades Association is obtaining from the secretaries of the various employers' associations of the country reports of what is being done by each association for publication in the N. M. T. A. monthly *Bulletin*. This promises to be very interesting reading, as there are about 150 employers' associations throughout the country. The organization of employers is making a marked advance. A noticeable feature of these organizations is that nearly all of them stand for the open shop principle.

The administrative council of the N. M. T. A. will hold a meeting in Cincinnati on Oct. 14 and 15. The following are members of the council: S. W. Watkins, president, Christensen Engineering Co., Milwaukee; H. N. Covell, 1st vice president, Lidgerwood Mfg. Co., Brooklyn, N. Y.; J. W. Gardner, 2nd vice president, Gardner Governor Co., Quincy, Ill.; F. A. Geier, treasurer, Cincinnati Milling Machine Co., Cincinnati; E. F. DuBrul, commissioner, Cincinnati; Phil. O. Geier, deputy commissioner, Cincinnati; Robert Wuest, secretary, Cincinnati. Councillors—G. F. Steedman, Curtis & Co. Mfg. Co., St. Louis; N. B. Payne, Payne Co., Elmira, N. Y.; W. P. Eagan, Fred. W. Wolf Co., Chicago; M. H. Barker, American Tool & Machine Co., Boston; F. B. Polson, Polson Iron Works, Toronto, Ont.; O. P. Briggs, Minneapolis Steel & Machinery Co., Minneapolis; Carl Horix, Geo. B. Sennett Co., Youngstown, O.; A. Falkenau, Falkenau-Sinclair Machine Co., Philadelphia. Honorary, W. H. Pfahler, Abram Cox Stove Co., Philadelphia.

As an instance of the way many employers fail to take advantage of the membership in the employers' associations until they find themselves in trouble, Commissioner DuBrul, of the N. M. T. A., cites the following example: A concern

wired: "Forwarding you check for $25 covering deposit and application for membership. Have your representative call." Mr. DuBrul answered: "When does your strike come off?" The reply was: "Tomorrow morning."

Despite the fact that the plant of the McKeesport Tin Plate Co., McKeesport, Pa., is operating in full, former employes of the plant affiliated with the Amalgamated Association continue to harass employes of the plant on their way to and from work. Furthermore, the Amalgamated Association never had jurisdiction over this plant, but despite this a fierce fight is being waged against the owners of the plant to submit to their demands. Because one of the strikers last week declared his intention of returning to the mill he was struck dead by a brother striker. Officials of the association continue to declare that the strike will not be called off, reports to the contrary notwithstanding.

The strike of the machinists in the Wheeling, W. Va., district continues in full force and neither party to the controversy is making any effort to bring about a settlement. .The strike was declared on July 1.

The *National Labor Tribune*, of Pittsburg, in its last issue printed the following editorial: "President Theodore J. Shaffer, of the Amalgamated Association, failed during the past two weeks to attend two of the most important meetings of the association. In view of the magnitude of the responsibilities and interests resting upon him as the representative and guardian of the Amalgamated Association, it is only natural that his unexplained absence from these important meetings should have resulted in a large number of newspaper comments. One Pittsburg paper quotes M. F. Tighe, assistant secretary of the association, as saying that the members of the association are very angry, and a number of our cotemporaries assert flatly that his resignation will be asked for. It was not many months ago that the *National Labor Tribune* made a suggestion about the Amalgamated Association's affairs which it may not be deemed amiss to recall on the present occasion. In saying that there never had been a time since our first identification with the Amalgamated Association as its official organ when its successful management required clearer brains and cooler heads, we were compelled to reflect upon the condition of affairs in the national lodge office. We were informed that there were officials there who were not giving the association their whole time and that there were personal strifes and jealousies which did not promote the welfare of the general membership. What we consider it proper to add now is that the association needs more than simply a resignation or two. The national lodge office should be cleaned out from top to bottom. We know something about the Amalgamated Association, and we do not hesitate to say that its affairs would be the better for a complete national lodge office reorganization."

The striking machinists at the plant of the Westinghouse Electric & Mfg. Co., East Pittsburg, Pa., now threaten to ask the aid of the American Federation of Labor in their struggle and hope to have a strike declared on the World's Fair buildings at St. Louis, where much of the machinery built by the company will be installed. Officials of the company declare that the strike is off so far as they are concerned, as all the positions vacated by the strikers have been filled and nearly all of the equipment at St. Louis is already in place.

The conference committee of the Sixth District of the Amalgamated Association will be called together shortly for the purpose of adjusting the skelp mill scale for the Youngstown Iron Sheet & Tube Co., of Youngstown, O. The scale has been held in abeyance since July 1, the mill working under the continuous clause of the scale.

The strike situation at the Harbison-Walker fire brick plants at Portsmouth, Sciotoville and Firebrick, Ky., remains unchanged. The company is importing labor and gradually increasing its forces, despite the picketing by the union workmen.

The secretary of the carriage and wagon makers' union at Cincinnati wrote the board of public service in that city, saying that a water works employe, a member of the union, had refused to pay his dues. The secretary after saying, "You will know that every man in your employment must belong to the trades organization if there be one" asks the board to compel the employe in question to pay his dues. The board decided that it had no power to help unions collect their dues.

The marine machinists employed at the Morgan Iron Works, New York, who were on strike with others for a minimum wage scale of $3 a day, returned to work Sept. 10 under the old terms.

The puddlers and finishers formerly employed at the Continental plant of the National Tube Co., Pittsburg, this week sent a delegation to the headquarters of the Amalgamated Association for the purpose of learning whether some settlement cannot be made with the National Tube Co. in order that they can return to work. The National Tube Co. up to the present time has not signed the Amalgamated scale for this plant, it being shut down now since July 1. None of the men are securing strike benefits as no strike is on, and unless some adjustment is made it is probable that the men will return to work without the scale being signed.

Aware of the fact that the men in their employ were on the verge of declaring a strike, the officials of the Stark Rolling Mill Co., Canton, O., posted a notice in the plant Sept. 12, stating that the works would close for an indefinite period. The management had announced that it intended to disregard the union limitation of output on the ground that it could not otherwise compete with the non-union mills of the American Sheet Steel Co.

## EASTERN PENNSYLVANIA.

HARRISBURG, Pa., Sept. 15.—Business among the iron and steel companies of this part of Pennsylvania is quiet, most of the large work having been taken care of and there being only the normal inquiry reported from the offices. The price of pig iron is making furnace companies careful and a number of concerns have been taking advantage of the time to make needed repairs to their stacks and some are stocking iron.

One of the largest contracts booked lately was for the highway bridge over the Potomac at Washington to take the site of the famous long bridge. Its cost will be over $950,000.

The Bethlehem Steel Co. has been making some large shipments of armor lately and deliveries are reported to be better than for some time. At Reading the Carpenter Steel Co. is planning for an extension of its steel plant, an open-hearth mill being reported as one of the improvements.

It is significant that the state department has not been issuing many charters to iron and steel corporations lately. Formerly there were a score a month.

The Empire Iron & Steel Co. is stocking iron at its furnaces in the Lehigh Valley for the first time in many months. There is about 29,000 tons of iron at Catasauqua, Reading, Topton and other furnaces. Three Crane furnaces are being run by the company and No. 5 is ready to light.

The Pennsylvania Steel Co. has put into operation its new frog, switch and signal department at Steelton, the largest in the country, and the output has been largely increased. The old shops will be used for other departments of the works.

The report that a crucible steel company will establish a plant in this city is incorrect. The works will be for metallic compounds.

The old iron ore mines in Cumberland and Adams counties are being reopened to supply furnaces in the Lower Susquehanna Valley. Their product is chiefly a brown hematite and the fact that they are being worked after years of idleness is significant. Formerly these mines supplied local charcoal furnaces. A Harrisburg firm has opened a large mine in Adams county.

Conditions about Lebanon are poor just now, but the Lackawanna Steel Co. has prepared two furnaces for blowing in and one Bird-Coleman has been stopped for repairs preparatory to a long campaign when the Lackawanna Steel Co.'s new plant at Buffalo is started. The company has five furnaces in the Lebanon district and they have been stocking iron for some time. The two stacks in operation are using the reserves of roasted ore. One of the Pennsylvania Steel Co.'s Lebanon furnaces is also idle.

The Lalance & Grosjean Co. is completing a large foundry at its tin mills here.

The Harrisburg Foundry & Machine Works have taken the orders for the engines for the electric power plant of Yazoo City, Miss.

The Superior Chain Co., of Marysville, may go out of business as the result of railroad improvements. Negotiations for its property are now under way.

The old Fullerton rolling mill, one of the leading iron works of the Lehigh Valley years ago, is being dismantled. It was bought by Philadelphians. It was built in 1867 and in 1870 became part of the plant of the Catasauqua Mfg. Co.

## SUGGESTED AT THE SHOP.

BY F. O. REMAN.

Drawings and their shadows, blue prints, will continue to be familiar features of shop practice. Just as long as there is any variation in the system or the product of the factory, drawings will multiply. Even if there had been established a manufacturing system of a maximum perfection in all details, and a product which was strictly uniform from one end of the year to the other, there would still be a field for a drafting room in getting out sketches to suit the different plants where the product is to be turned out, to deal with the improvements proposed and generally to serve as a clearing house for engineering propositions and problems in the rough. So numerous are the demands upon the drafting room in the average plant that any method of shortening the labor or improving the system as a whole is well worth while. But the satisfaction of that department with the tools handed down through a series of generations, with little or no change, suggests a conservatism not easily disturbed.

* * * *

Conservatism is not usually reckoned the chief characteristic of an originating department. A place where ideas are shaped into practical form would seem the least likely to work into a rut. I have just been shown a very neat design for a section liner—one of those ingenious devices whereby, with some practice, you may draw a succession of parallel lines to indicate a break in the material shown on the drawing. A neat series of lines with uniform spacing can be drawn by the simplest means plus sufficient practice. But the last item breaks up the craftsman and forthwith the fruitage of a long felt want in a section liner. Often the idea is a step-by-step scheme, and arrangement of two pieces of wood, rubber, celluloid, glass or something of the kind, where the one piece slides on the other between certain limits which determine the width of the spaces set by the lines drawn. There is a slavish dependence upon the instrument thereafter which cuts off the probability of the draftsman ridding himself of his mechanical aid. From that time on he must be shackled to his assistant. On the other hand, a determined attempt in the first place to acquire the art of drawing the lines with the setsquare would have made the other plan useless.

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Perhaps the danger of doing poor work while the education of the eye and hand was under way has had something to do with section liner invention. It is possible to do just as good work without the assistance of a section liner. Every drafting room has—or ought to have—a supply of squared paper. A piece of this under the tracing cloth or the bond paper will serve as a guide and the habit of moving the tools a specified distance is the sooner acquired. This guide may not be continued any longer than the need demands, but is a very useful expedient, serves as a gauge, in order that there may be some standard to the work, etc. Then the squared lines are handy in lettering, either of the plain or ornamental kind, the laying out of a title with some approach to symmetry, etc. But I must stick to the section liner. And the section liner is pretty numerous. It has been devised by the dozen and the end is not yet.

* * * *

Can these section liner improvements not be brought to a focus? Some form of device upon which there shall be the general verdict of approval. Machine-like regularity will encourage the manufacture of special instruments just as the insistence upon hand practice in section lining will help the workman to throw away his crutches. To get back to first principles, and with due apologies for the abruptness of the inquiry, What is the necessity of section lines? Nothing that I can say is apt to change the practice, which, like many other things, is deep-rooted, and my question refers only to the manner of indicating sections. Some system is necessary, but is the one commonly adopted the best in sight?

* * * *

Suppose the drawing of these sight-trying lines be thrown overboard and we try something else. The substitute must be unmistakable in showing a difference between the sections and other portions of the drawing and must be adaptable to blue printing. A system of symbols to show sections is not easily arranged and it is hard to see how any method of the kind could be distinctive enough to compare with section lines. Then the character might mix with other letters and figures and there would be at some critical period confusion worse confounded. The plan would not help the case. The more obvious scheme would be the laying on of a tint. Something midway between the black lines of the boundary limits and the white space enclosed. A diluted ink laid on with a brush would not interfere in the slightest with dimension lines or figures. So far as choice goes, the flat tint would be less likely to be in the way as compared with the line system. The tint would print well and would be distinctive on drawing and blue print. The method has been tried and works satisfactorily, but is radical and hence may not displace the older plant. Any one can try it with a brush and the simplicity of the means of making a trial would apparently be ample to put the average section liner out of business. Should this happen, however, a goodly supply of inventive talent, which is now concentrated upon section liner improvement, could be focused elsewhere. That end is not yet and I wait for a few pointers on the necessity of section lines versus the flat tint for same purpose. I know that the books and teachers advocate special styles of section-lining to show difference in material, etc., but these refinements really do not count. I find few offices where they are followed, and for that matter the portion which is not section lined usually forms the greater part of the showing, and this gets along with plain lines very nicely. The plain initials of the material are unmistakable and would work as well on the flat tint as on the rest of the drawing.

## No Reduction in Machinists' Wages Proposed.

(Special Telegram.)

CINCINNATI, O., Sept. 16.—At the headquarters of the National Metal Trades Association in this city the following reply was made today to an inquiry by *The Iron Trade Review's* representative: "The statement in this morning's papers, in a Chicago dispatch, that the National Metal Trades Association proposes a 10 percent reduction in machinists' wages, is a deliberate falsehood. Evidently some parties conceive it to be to their interest to stir up trouble between members of this association and their employes and this statement seems certainly to be for that purpose. It is the same old game of misrepresentation and falsehood."

## Receiver for the Consolidated Lake Superior Co.

Dissatisfied stockholders of the Consolidated Lake Superior Co. have issued the following statement:

"The management of the Consolidated Lake Superior Co. having refused our just demands made upon them through counsel for the names of the subscribers to the $11,088,400 contract of subscription to preferred stock of the company, upon which the company's report of June 30, 1902, admits that a balance of $9,239,100 was then due and unpaid, and having failed also to give any reason whatsoever for not having enforced the payment of said subscriptions, it is important that immediate steps should be taken for the protection of our rights as stockholders. As the best means of accomplishing the desired result it is proposed to apply for the appointment of a receiver or receivers for the corporation, this being regarded under the advice of counsel as the most effective course to pursue. As it is deemed important that all those stockholders who are determined to assert their rights to ascertain the true financial status of the company before accepting blindly any proposed scheme of reorganization, and to protect their interests generally, should join in this movement, we call upon all stockholders so disposed to send to us at once their full names and the amounts of stock held by them respectively."

Vice President E. H. Sanborn, on behalf of the company, issued a statement in which he declared that the company was not a party to the sale of the last $20,000,000 of its preferred stock. The underwriting agreement, he explained, was with the Algoma Steel Co. and the agreements, etc., are all with it and the books are in the Canadian office. The Consolidated owns all the stock of the Algoma Co. and the officers and directors are identical.

## AMERICAN STEEL FOUNDRIES.

The American Steel Foundries publishes this week in connection with its annual meeting its first annual report, covering the fiscal year ending July 31. The earnings of constituent companies, after works, administration and selling expenses are deducted, were $2,193,678.90, from which is deducted $432,741.04 expended and provided for renewals, relining, repairs and maintenance. The net earnings, with the addition of $27,026.88 for rentals, interest and exchange, are $1,787,964.74. General office expenses, rentals, salaries, taxes and interest on loans ($19,562.39) are $231,011.53, leaving net income of $1,556,953.21. Deducting $23,550 interest on bonded debt to July 31, 1903, leaves $1,533,403.21 surplus available for dividends. The balance sheet on July 31 is as follows:

| | | |
|---|---|---|
| **ASSETS.** | | |
| Real estate, buildings, plant, machinery and other permanent investments at July 31, 1902, adjusted in respect of certain liabilities and assets since ascertained and properties subsequently acquired, *less* sales of old machinery and equipment, $26,718.29 | $29,012,124 33 | |
| Amount expended on additions, extensions and improvements during the year | 403,246 30 | |
| | $29,415,330 63 | |
| Real estate not used for business purposes | 310,365 36 | |
| | | $29,725,735 99 |
| Deferred charges to profit and loss and payments in advance | | 39,585 66 |
| CURRENT ASSETS: | | |
| Inventory—Raw materials, supplies, finished product and work in progress, on hand and in transit July 31, 1903, at cost | $1,011,533 29 | |
| Accounts and bills receivable | $1,874,756 27 | |
| *Less* reserve for bad and doubtful debts, etc | 14,953 65 | |
| | 1,859,802 62 | |
| Sundry investments | 20,600 00 | |
| Cash in hand and at banks | 660,755 22 | |
| | | 3,552,691 13 |
| | | $33,318,012 78 |
| **LIABILITIES.** | | |
| CAPITAL STOCK: | | |
| Authorized— | | |
| Preferred, 200,000 shares of $100 each, | $20,000,000 00 | |
| Common, 200,000 shares of $100 each, | 20,000,000 00 | |
| 400,000 | $40,000,000 00 | |
| Issued— | | |
| Preferred, 155,000 shares of $100 each, | $15,500,000 00 | |
| Common, 155,000 shares of $100 each, | 15,500,000 00 | |
| | | $31,000,000 00 |
| Underlying bonds of subsidiary companies (outstanding) | | 471,000 00 |
| Bills payable relating to real estate not used for business purposes | | 200,000 00 |
| CURRENT LIABILITIES: | | |
| Audited vouchers and current accounts payable | $634,715 34 | |
| Pay rolls and interest accrued | 149,062 36 | |
| Contingent reserves and provisions for completing relining, repairs and renewals in progress | 28,031 87 | |
| | | 811,809 57 |
| PROFIT AND LOSS ACCOUNT: | | |
| Net earnings for the year ending July 31, 1903 | $1,533,403 21 | |
| *Less dividends paid:* | | |
| On outstanding stock of constituent companies | $700 00 | |
| Preferred dividends paid Nos. 1, 2 and 3 | 697,500 00 | |
| | 698,200 00 | |
| | | 835,203 21 |
| | | $33,318,012 78 |

In his annual report President Joseph E. Schwab says:

"There was expended during the year just closed for additions, extensions and permanent improvements chargeable to capital account, the following amounts:

| | |
|---|---|
| Additional railway tracks and motive power | $ 16,448 88 |
| Additional power, engines, boilers, elec. generators | 70,399 99 |
| Additional buildings and extensions | 131,171 04 |
| Additional furnaces, equipment, appliances, etc | 185,226 39 |
| Total | $403,246 30 |

"These expenditures have resulted in the material reduction of costs and very large increase in productive capacity. In addition to the above outlay we have expended out of earnings for the year for maintenance, renewals, relinings and improvements not chargeable to capital account, the sum of $432,741.04. There has also been created a reserve fund to cover any possible losses which may occur in the accounts and bills receivable of the company.

"It has been the aim of the management to make liberal reservations for all possible adverse conditions and therefore they have not hesitated to adopt this course in the first year of its existence. Drastic measures have been resorted to in adjusting the accounts of the company, and during the year many errors and discrepancies in the accounts of the various companies acquired by this company have been corrected and transpositions made from current account to plant account, where they were properly chargeable to plant account.

"During the year the entire capital stock of the American Steel Bolster Co., amounting to $500,000 face value, has been acquired by this company; payment therefor having been made by the issue of $500,000, face value, of the common stock of this company. The American Steel Bolster Co. is an Illinois corporation owning sundry patents covering the manufacture of cast steel bolsters for railway cars. These bolsters were manufactured by one of the companies acquired by this company, under a royalty agreement, which was assumed by this company in the purchase of the business and property of said company. The bolster company was acquired as at December 1, 1902, and the cash saving to this company by this purchase since that time on the basis of the royalty agreement is approximately $70,000, or at the rate of practically 21 percent per annum on the par value of the stock issued therefor.

"The business of the company has been fully maintained during the year and there is now a larger tonnage of orders on our books than at the time of the organization of the company. The physical condition of the properties has been much improved during the year and additions and improvements are contemplated for the ensuing year, whereby it is hoped to still further increase production and reduce costs. The cost of production has been high during the year owing to the very high price of materials and labor, and the management feels in view of these conditions that the net profits have been satisfactory."

## Thomas Iron Co.'s Semi-Centennial.

The annual meeting of the stockholders of the Thomas Iron Co. was held at Hokenauqua, Pa., Sept. 8, 1903. Hon. Charles F. Chidsey, of Easton, Pa., presided. The old board of directors was re-elected, as follows: Samuel Thomas, William H. Hulick, William P. Hardenbergh, B. F. Fackenthal, Jr., Fred R. Drake, Joseph S. Rodenbough, and J. Samuel Krause. The board re-elected the old officers: B. F. Fackenthal, Jr., president; William H. Hulick, vice president; and James W. Weaver, secretary and treasurer. The meeting was largely attended and considerable interest was shown in the historical sketches of the company, presented by the president and included in his annual report. Reference was made to the fact that before the time for holding the next annual meeting the company will have been organized fifty years. It was on Feb. 14, 1854, that the first meeting was held for organization in Easton, Pa., at Mrs. White's hotel in Centre Square. This meeting was attended by eighteen people. Officers were appointed and a charter was applied for, which was granted under date of April 4, 1854. There were twenty-five original stockholders, but one of whom is living, Mr. Samuel Thomas, of Catasauqua, Pa.

It was decided to observe the semi-centennial anniversary of the company with a jubilee celebration of all the stockholders of the company on or about April 4, 1904. The Thomas Iron Co. has been in successful operation ever since its organization fifty years ago, and appears to be the only company manufacturing pig iron in the Lehigh Valley, and doubtless in the entire country, that has continued in operation for so long a time without reorganization or having been absorbed by some other company, or having its original corporate name changed.

The new blast furnace of the Cleveland Furnace Co., Cleveland, made a successful start about Sept. 1, and has been running on Bessemer iron. In October it will turn to strong foundry and Scotch grades for the general market. It will also be prepared to take care of the malleable trade. It is expected to be an important factor in the iron business of the Cleveland district. Rogers, Brown & Co. sell its output.

## LAKE SUPERIOR IRON MINES.

The Minnesota Iron Co. has let contracts to the Drake & Stratton Co. for the removal of an amount in excess of 2,000,000 cubic yards of earth and other overburden from the Fayal mine at Eveleth, Mesabi range. This work will take 400 men day and night for a period of three years, and four of the largest size steam shovels employed in stripping operations will be kept continuously busy. The contract is one of the largest ever let, and with its completion there will have been moved from the Fayal more than 8,000,000 yards of overburden. This contract contemplates the increase of No. 1 open pit to the south, and comes on the large dump southeast of No. 1 shaft, which was placed there in the early stages of development.

One result of the purchase of the Chemung properties by the United States Steel Corporation is the revival of the Higgins, and the decision to sink a shaft there. Stripping is under way and the ore body is to be milled. The larger part of the ore in this deposit is not on the Higgins lands but on the McEwan 55 acres, and this latter was a part of the Chemung purchase. The ore is of very high grade, averaging 62 percent iron and running down to an average of about 0.035 phos. There are some 3,000,000 tons in the property which is in the Virginia section of the range. The structure of this ore is most desirable. The new shaft is 3-compartment, 8x16 feet inside timbers.

Iroquois Mining Co. operating the Iroquois mine, on section 1-58-18, has let a contract for the removal of 700,000 yards of stripping. The mine will be operated as a milling property and a shaft is now well along. This mine contains about 2,500,000 tons of 57 percent non-Bessemer ore. A greater tonnage may be shown later in the course of developments. It is operated through Rogers, Brown & Co., and belongs to the Iroquois Furnace Co., of Chicago.

Reports of the discovery of hard ore on the Mesabi range are somewhat misleading, for hard ore has been mined and crushed at the Biwabik for years, and the new finds are close by that property to the east. There have been found on explorations by the Minnesota Iron Co. and by Wm. Rock some hard ore, chiefly on the former's work in section 6-58-15, but the extent and value of the find is not known.

East Biwabik Mining Co., after the expenditure of some $30,000 on explorations near the old village of Merritt, is ceasing work and dropping its options. The men comprising the company were not mining people, and took land that mining men did not consider of any particular promise.

At Monroe mine of the Minnesota Iron Co., which is one of the Chemung purchases, they have increased the contracts for dwellings for employes and 60 are soon to be under way. Three shafts are sinking. It is impossible that any considerable amount of ore shall be shipped from this mine prior to 1905, but then it will be one of the very large mines of the district.

Shafts of both the Clark and Chisholm mines, Mesabi range, in section 28-58-20, are in the ore. No. 3 of Clark is southeast of No. 1, which will be abandoned. No. 2 of Chisholm is south of No. 1, which will be mined out. Both the new shafts will be tributary to the Duluth, Missabe & Northern road, though the mines have been shippers over the Great Northern.

The Duluth, Missabe & Northern road is surveying a line to the new Monroe mine, whose ore hauling is a very rich plum. The Great Northern expects this ore and will probably fight for it.

A new pump, of greater capacity than any before, has been installed at the Shenango mine, Mesabi range 27-58-20, and the work of opening is expected to proceed without further difficulty.

Exploration is under way on the Turney lands in the southeast part of 58-18, north of the Gross property.

The Roy Iron Co. has been formed to explore and operate the so-called "Roy" lands near Tower, Minn.

It is reported in the daily press that the land of Thos. Walsh adjoining Tower Junction, Minn., south of the Minnesota hard ore hill, has shown an ore formation of considerable width, but details are lacking. It is also reported that a miner at Soudan, while digging for potatoes in his garden, unearthed a find of soft ore, which has been traced for a considerable width. Both tales are of the "important if true" class.

The famous section 30-63-11, Eastern Vermillion range, which was under option to the Section 30 Co., has been taken by G. N. Lonstorf, one of the fee holders. He will operate several drills there at once, and will sink two exploratory shafts a little later. These holes will be sunk north of those put down by the previous explorers, and the shafts will be sunk on lot 6, to strike some ore that was cut by the drills of the Section 30 Co. Mr Lonstorf has let contracts for the drill work to the Cole & McDonald Co., and will sink the shafts by contract also.

The Chicago mine, Gogebic range, operated by the Oliver Iron Mining Co., has been shut down for the season.

Important improvements are to be made on the Bristol mine, Menominee range. A new hoisting and steam plant is to be installed.

The work of pumping out the water in the Armenia mine, Menominee range, is progressing rapidly with the aid of the pump brought from the Prescott mine on the Mesabi. As soon as the mine is dry the diamond drill work and the drifting will be continued.

The Oliver Iron Mining Co. has decided not to ship the ore that is in stock at the Columbia mine, Menominee range, until next year.

The Winthrop mine at Ishpeming has been closed down for the season. During the season from 60 to 75 men have been employed in the operations at this property, and at the time of closing about 70 men were being employed.

The Michigan mine near Amasa, Mich., will enter the regular producing list Oct. 1, if the Mineral Range railroad succeeds in finishing its extension from Riddle Junction to the mine by that time.

The Richmond mine on the Cascade range, south of Negaunee, Mich., has been acquired by the Consumers' Ore Co. M. A. Hanna & Co. are interested and will handle the ore. The Richmond lease has been owned by A. Maitland under the name of the Richmond Iron Co. The Richmond ore is a silicious Bessemer of 50 percent metallic iron and is mined from the open pit.

The Penn Iron Mining Co. has lately acquired an option on a mining lease from Wm. J. Tully, of Iron River, and J. H. Quinn, of Ishpeming, Mich., upon the Baker property, which is on Section 31-43-34, on the Menominee range near Stambaugh, Mich. The exploration is regarded a promising one. It adjoins the Caspian mine on the northeast, and it is considered probable that it has a continuation of the Caspian ore. Some drill work has already been done, a perpendicular hole put down 480 feet having cut about 220 feet of ore, a good proportion of which shows 62 percent in metallic iron. Work will be pushed until the land has been thoroughly tested by cross cutting the iron formation with a series of drill holes.

An Eastern furnace company has under consideration the unwatering of the shaft and the resumption of active mining at the American mine situated in the western portion of the Marquette range. This mine has been inactive for several years, having last been operated by the American Mining Co. in 1892, but was closed during the depression. The American mine has produced an excellent grade of hard specular ore. By care in mining the ore will run high in metallic Iron and .04 in phosphorus.

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The New York Blower Co., Bucyrus, O., has passed into the hands of a receiver. The company was organized under the laws of Ohio with a capital of $150,000. The greater part of the stock is owned by R. C. Penfield, who was involved in the recent failure of the American Clay Working & Machinery Co., of which he was president.

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The first heat of steel was blown in the new plant of the International Harvester Co. at South Deering, Ill., Sept. 3. Superintendent Hale announced that the test was satisfactory and that the plant would be in complete operation within a few weeks. It will have a capacity of about 400 tons of steel per day.

## THE HISTORY OF BABBITT METAL.

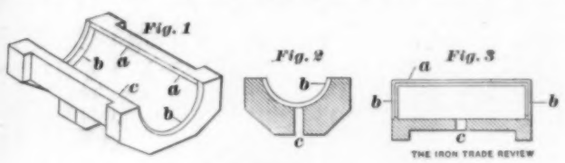
An erroneous idea appears to prevail in regard to the invention of Babbitt metal, and now that this alloy is so extensively used the time seems opportune for the correction of this belief. Although Isaac Babbitt was the inventor of the method of using soft metals in journal boxes, his patent specification makes no claim on the alloy itself, but simply on the method of holding the soft metal in place. Reference to the copy of the patent specification given below will corroborate this statement.

Isaac Babbitt was born in Taunton, Mass., on July 26, 1779. He learned the trade of goldsmith, and in his native town made the first britannia ware produced in the United States. This took place in 1824. This enterprise proved unsuccessful; he then removed to Boston and entered the employ of the South Boston Iron Works, and in 1839, while an employe of this establishment, he produced the invention which has perpetuated his name. For this invention he was given a gold medal from the Massachusetts Charitable Mechanics' Association, and afterwards Congress granted him the sum of $20,000 as a reward. In 1884 the invention was patented in England and in 1847 in Russia. After devoting some time to the production of metals he engaged in the manufacture of soap, so that his name has become almost a household word. He died insane at the McLean Asylum, Somerville, Mass., on May 26, 1862.

The following is a verbatim copy of the patent specification now out of print, so that printed copies cannot be obtained from the Patent Office:

Isaac Babbitt: Improvement in the mode of making boxes for axles and gudgeons. Specifications forming letters patent No. 1252, dated July 17, 1839.

To all whom it may concern: Be it known that I, Isaac Babbitt, of the city of Boston, in the state of Massachusetts, have invented a new and improved mode of making or con-




THE BABBITT PATENT.

structing the boxes with which the gudgeons or journals of machinery in general, and the axles of railroad cars, locomotive engines and other cars and carriages are to be run by which mode of constructing or making such boxes or bearings, the heating and abrasion of which is apt to occur under the ordinary mode of constructing them are prevented, and their durability is consequently increased; and I do hereby declare that the following is a full and exact description thereof:

I prepare boxes which are to be received into housings or plummer blocks in the ordinary way of forming such boxes; making them of any kind of metal or metallic compound which has sufficient strength and which is capable of being lined. The inner parts of these boxes are to be lined with any of the harder kinds of composition known under the names of Britannia Metal or Pewter, of which block tin is the basis. An excellent compound for this I have prepared by taking 50 parts of tin, 5 of antimony, and 1 of copper. But I do not intend to confine myself to this particular composition.

To prepare the boxes for the reception of this composition, I cast them with projecting rims along their interior edges and on their ends within the semi-cylindrical part which is to receive the axle or gudgeon. I then tin the inner surface of said boxes and the ledges or rims above named in order to cause the metallic composition with which they are to be lined or cased to adhere to them. Fig. 1 in the accompanying drawing is a perspective view of one of these boxes. Fig 2 is a cross and Fig 3 a longitudinal section through *a a*, in figures 1 and 3 are the ledges or rims along the edges, and *b b* those around the ends of said box. The use of these is to hold the metallic lining firmly in place and prevent spreading. The lining may be used, however, without such ledges or rims. In finishing one of these boxes I proceed in the following manner:

I coat the outside, including the rims, with tin in the well-known manner of performing that operation. I then take a cylindrical or semi-cylindrical, former of the exact size in its cylindrical part of the gudgeon or axle, which is to run within it, and upon this axle or gudgeon or former, I place my box in such a manner that the axis of the axle or gudgeon, and of the curvature of the box shall coincide, my box being of such size as that when so placed the projecting rims or ledges shall not touch, but shall be nearly in contact with the gudgeon or axle, say within the distance of from 1-16 to 1-32 part of an inch more or less. I then close these places by any suitable means and it is then prepared to receive the lining of composition metal which is to be melted and poured in.

For the purpose of pouring it in, there is a hole "*c*" left through the middle of the box, which in those for railroad cars may be an inch in diameter and will in all cases be proportioned to the size of the box. The metal thus poured in will take to the tinned surface of the interior of the box and surrounding rims and ledges and will cover the edges of the latter so as to prevent contact between them and the axles or gudgeons which they are to receive, whilst the ledges will effectually check any tendency in the metal to spread from the weight and the friction of the load; when the edges are not used the coating of composition metal should be but thin. Having thus fully described the nature of my improvement and shown the manner in which I carry the same into operation which I claim as my invention and desire to secure by letters patent is the making of the boxes for axles or gudgeons in the manner above set forth, that is to say by the casing of hard pewter or composition metal of which tin is the basis into said boxes, they being first prepared and provided or not with rims or ledges and coated with tin as herein described and made known. (Signed) ISAAC BABBITT.

Witness
THOS. P. JONES,
LINTON T. HORNE.

The fact that in the patent specification no claim is made for the alloy is sufficient to dispel the ordinary belief in this direction. Britannia metal, pewter or an alloy of tin 50 parts, antimony 5 parts and copper 1 part are recommended. The latter alloy is somewhat softer than that now known as "Genuine Babbitt," which is commonly composed of tin, 96 parts; antimony, 8 parts, and copper 4 parts. The original idea in the use of soft metal was practically the same as it is now, i. e., to make a bearing which would conform to the surface of the axle. It is natural then that the alloys used today are somewhat harder than the original material employed. It is also natural that the name Isaac Babbitt should have been handed down to posterity as the inventor of the alloy, although, of course, quite erroneously.—[Metal Industry.

### Loss of Iron in Blast Furnaces.

B. Osann, in *Stahl and Eisen*, states that in smelting iron ore in the blast furnace, metal is lost in the form of ore carried off as dust in the gases and by the scorification of ferrous oxide in the slag. The actual loss is apparently diminished by the iron content in the coke ash and the limestone flux which is not taken into account in making up the charges. The total loss of metal ranges from nothing up to 5 percent and even more, in the most unfavorable cases. In smelting unroasted oolitic ores the average is probably about 3 percent. Calcined spathic iron ore and burned pyrites residues give rise to much dust in the gases. The quantity of dust carried per cubic meter of gas discharged varies between 5 and 20 grams, the proportion of iron contained varying between 12 and 45 percent. With a consumption of 110 parts of coke per 100 parts of metal smelted, the coke containing 7 percent of ash assaying 7 to 11 percent ferrous oxide, which percentage of iron is to be found in the ash of Westphalian coke, the loss of iron in the form of dust carried off by the gases is completely compensated by that which is introduced in the coke.

The Wisconsin & Michigan Railroad, which operates a line from Peshtigo Harbor, on Green Bay, to Norway, Mich., a distance of about 70 miles, proposes to become an active competitor for ore traffic in the Northwest. Surveys have been made for extensions north and west into the Gogebic and Menominee iron districts, to carry ore across the lake from Peshtigo Harbor to Chicago and other ports. The Lake Michigan Car Ferry & Transportation Co., which will operate in harmony with the railroad, has given orders for the construction of two immense ferries on which cars will be loaded. It is proposed to run the cars loaded with ore onto the ferry boats and carry them down to South Chicago and connect them with the great trunk lines without unloading.

The State capital commission, Minneapolis, has awarded a contract for the complete equipment of the new Minnesota steel capitol building with metal shelving, file cases, book racks and similar equipments to the Van Dorn Iron Works, Cleveland, whose bid was $32,017.

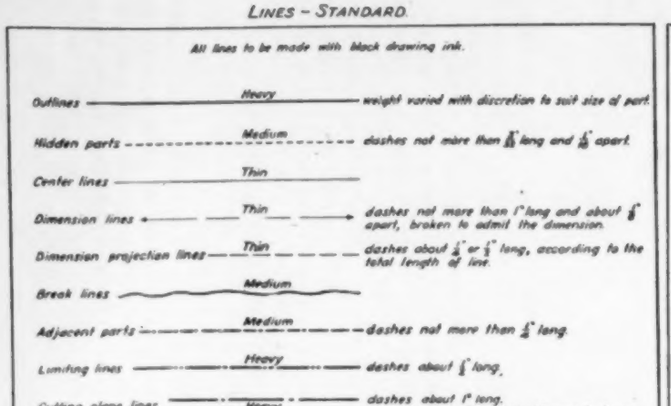

LINES - STANDARD.
All lines to be made with black drawing ink.
Outlines — Heavy — weight varied with discretion to suit size of part.
Hidden parts — Medium — dashes not more than 1/8" long and 1/8" apart.
Center lines — Thin
Dimension lines — Thin — dashes not more than 1" long and about 1/8" apart, broken to admit the dimension.
Dimension projection lines — Thin — dashes about 1/4" or 1/8" long, according to the total length of line.
Break lines — Medium
Adjacent parts — Medium — dashes not more than 1/4" long.
Limiting lines — Heavy — dashes about 1/8" long.
Cutting plane lines — Heavy — dashes about 1" long. use this when it is desirable not to have line cutting through view.
No shade lines to be used. The contrast between the heavy and thin lines to be sufficient to make the part represented stand out clearly.
WESTINGHOUSE ELECTRIC & MFG CO, PITTSBURG, PA.

Fig. 1.

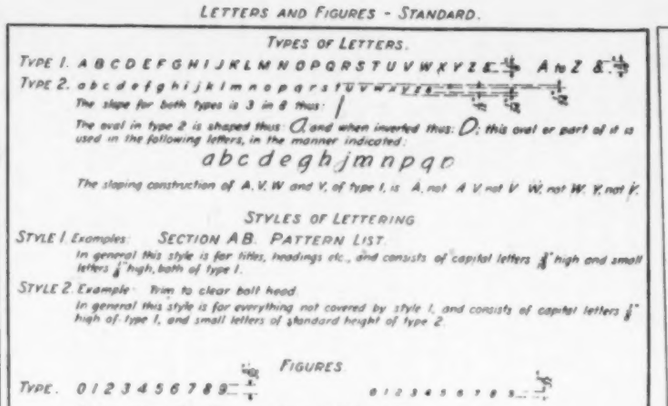

LETTERS AND FIGURES - STANDARD.
TYPES OF LETTERS.
TYPE 1. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z &
TYPE 2. a b c d e f g h i j k l m n o p q r s t u v w x y z &
The slope for both types is 3 in 8 thus: /
The oval in type 2 is shaped thus: a and when inverted thus: D; this oval or part of it is used in the following letters, in the manner indicated:
a b c d e g h j m n p q r
The sloping construction of A, V, W and Y, of type 1, is A not A V not V W not W Y not Y.
STYLES OF LETTERING
STYLE 1. Examples: SECTION AB. PATTERN LIST.
In general this style is for titles, headings etc., and consists of capital letters 1/4" high and small letters 1/8" high, both of type 1.
STYLE 2. Example: Trim to clear bolt head.
In general this style is for everything not covered by style 1, and consists of capital letters 1/8" high of type 1, and small letters of standard height of type 2.
FIGURES
TYPE. 0 1 2 3 4 5 6 7 8 9
Whole numbers: 5 10 Decimals: 0.025 0.75
Fractions: 1/8 1/4
When there is not room for standard figures, and smaller ones have to be used, they must be made with the greatest care and as clearly as possible.
WESTINGHOUSE ELECTRIC & MFG CO. PITTSBURG, PA

Fig. 2.

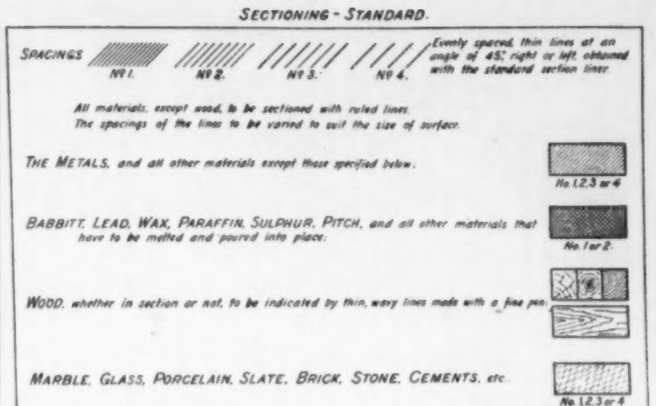

SECTIONING - STANDARD.
SPACINGS
No 1. No 2. No 3. No 4.
Evenly spaced, thin lines at an angle of 45° right or left, obtained with the standard section liner.
All materials, except wood, to be sectioned with ruled lines.
The spacings of the lines to be varied to suit the size of surface.
THE METALS, and all other materials except those specified below.
No. 1, 2, 3 or 4
BABBITT, LEAD, WAX, PARAFFIN, SULPHUR, PITCH, and all other materials that have to be melted and poured into place.
No. 1 or 2.
WOOD, whether in section or not, to be indicated by thin, wavy lines made with a fine pen.
MARBLE, GLASS, PORCELAIN, SLATE, BRICK, STONE, CEMENTS, etc.
No. 1, 2, 3 or 4
INSULATING MATERIALS, as fuller board, mica, rubber, fibre, asbestos, felt, paper, tape, etc.
thickness not exceeding 1/8"
thickness exceeding 1/8"
No 4 45° lines

Fig. 3.

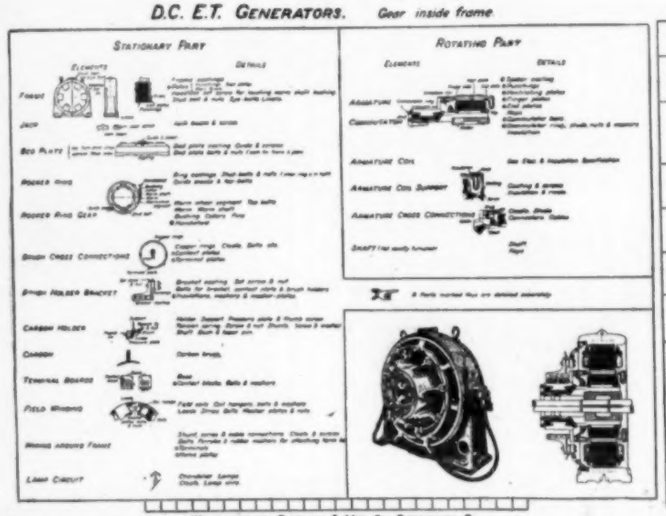



Fig. 4.

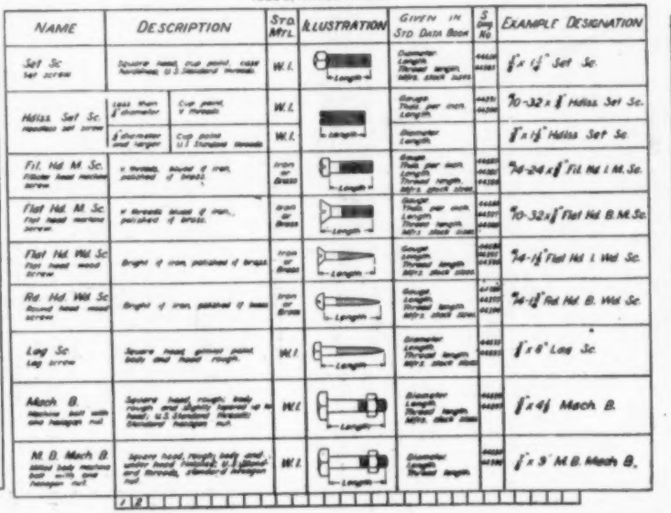



Fig. 5.

PAGES FROM A DRAFTING ROOM DICTIONARY.

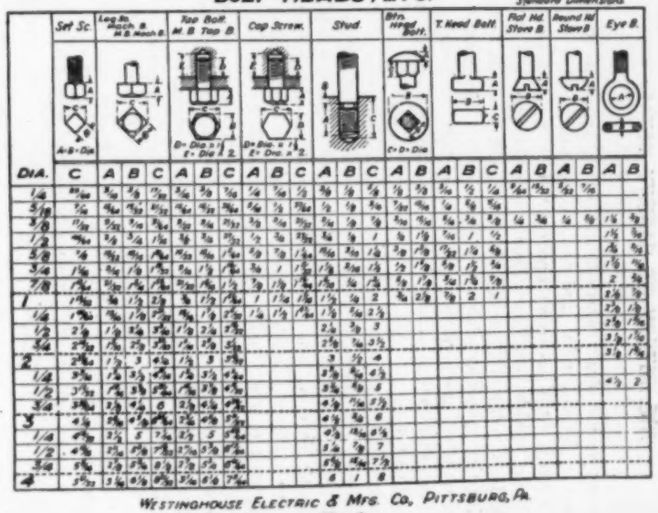



Fig. 6.

# Mechanical Drawing in the Modern Drafting Room.*

BY GEORGE H. FELLOWS.

I would have mechanical drawing looked upon and taught as a "language"; a mechanical drawing becomes then the "writing of a language." This is a broad or general definition will suffice for the present; we shall arrive at something more complete and comprehensive later on. The part that instruments play in the writing of this language is analogous to the part that the typewriter plays in the writing of English. In both cases a certain amount of skill is required to manipulate the instrument, but mere mechanical skill does not make any draftsman any more than it makes a stenographer. In both cases comprehensive brain knowledge of the subject (backed by common sense) is the essential.

By a modern drafting room I mean the drafting room of a manufacturing concern as distinguished from that of a concern that simply makes things. And it must be an up-to-date manufacturing concern, one that desires its product to be in every way good, is prepared to grow to any size, and is managed by men who have already realized that the work of the drafting room, like that of the shop, must be done systematically. There are shops even now where the drafting room is looked upon more as an irritating source of expense than anything else—"to be done away with some day, when we get things going." That, of course, is not the way we look at it. The drafting room is of as permanent use and value to the whole concern as the tool room is to the shop. And we must in the first place grant it this permanent place; it must be expected to stay and to grow with the business.

I like to look upon drawings as "tools" so made as to be of as much and as permanent use as possible to the whole concern, and particularly to the shop. They should contain all information needed by the shop and by all offices connected with the shop, as well as such information as is needed for reference in the drafting room; but drawings should in no way *interfere* with the shop. They should clearly and unmistakably indicate required *results*, but "how to get the results" should, when possible, be left to the shop, where by right it belongs.

I have seen drawings that have contained instructions like plane, bore, file, chip, turn, mill, etc. Such instructions are, as a rule, not only unnecessary but often lead to trouble. If, for example, the shop decides to grind instead of chip, or mill instead of plane, the drawing is immediately at fault; in other words wrong. There is a general principle that should always be kept in mind by the draftsman: "Drawings should be made right to stay right." This principle is many sided in its bearings; for instance, it must be remembered when naming the parts of a machine; If on the spur of the moment a material is included in the name of a piece, as "wooden ring," "fiber washer," and it is decided later (we will say a year later, after all catalogues, circulars and printed matter in general have been issued using these names) that the ring is best made of fibre and the washer of brass, there have been introduced two very absurd errors; we have a "wooden ring" made of fibre and a "fibre washer" made of brass. And it will not be at all an easy matter to root out these mistakes.

Before going further I would like to say something about mechanical drawing as a language. This way of looking at it is not new, but it is made less use of than it might be. When we think of a language, as of English, we have in mind an alphabet, words and sentences; and going further, to the written language as we find it in literature, we add, in the main, chapters and books. Now, I would like to see it recognized that there is an analogy between English as a language and mechanical drawing as a language; the analogy can be made of real practical value to the student as well as to the teacher of the subject. Under English we have:

1. An alphabet of letters.
2. Words.
3. Sentences.
4. Chapters.
5. Books.

Under mechanical drawing we have:

1. Analogous to the alphabet of letters an alphabet of lines.
2. Analogous to words we have views.
3. Analogous to sentences groups of views representing pieces.
4. Analogous to chapters drawings (representing groups of pieces).
5. Analogous to books complete sets of drawings representing complete machines.

In the matter of uniformity, makers of books have gone a long way ahead of makers of drawings. Take any two books and compare them; in general you will find on the back of each the name of the book, of the author, and of the publisher; inside you will come first to the title page, then a preface, then perhaps a frontispiece, and Chapter I. The page numbers are placed at the upper right and left hand corners; each chapter

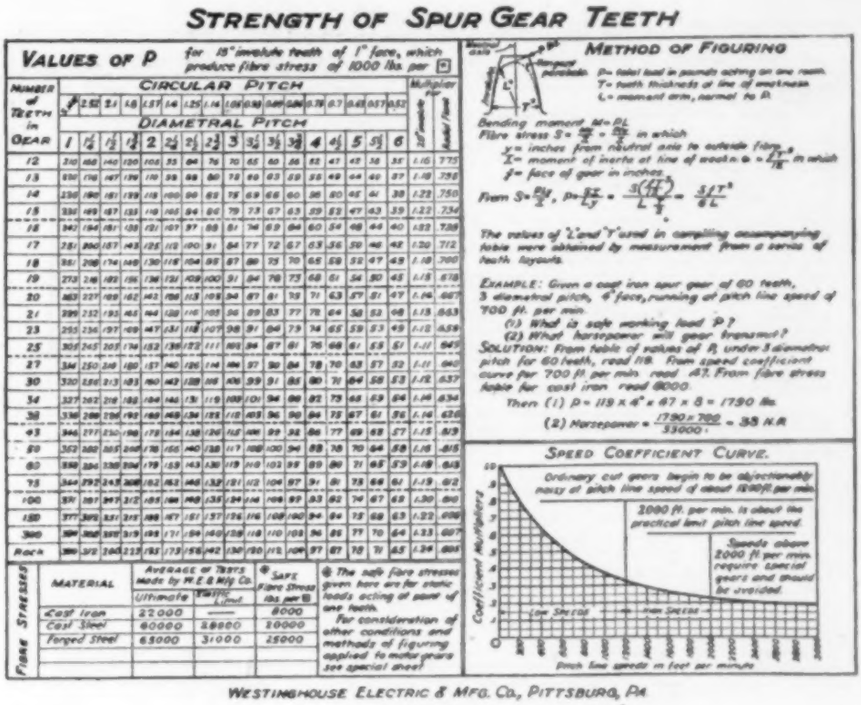

STRENGTH OF SPUR GEAR TEETH
VALUES OF P
METHOD OF FIGURING
CIRCULAR PITCH
DIAMETRAL PITCH
SPEED COEFFICIENT CURVE.
Ordinary cut gears begin to be objectionably noisy at pitch line speed of about 1500 ft per min.
2000 ft. per min. is about the practical limit pitch line speed.
Speeds above 2000 ft per min require special gears and should be avoided.
Low Speed
Iron Speed
Pitch line speeds in feet per minute
Coefficient Multipliers
MATERIAL
Cast Iron
Cast Steel
Forged Steel
WESTINGHOUSE ELECTRIC & MFG. Co., PITTSBURG, PA.

Fig. 7.

*From a paper read before the Engineers' Society of Western Pennsylvania.

is divided into paragraphs and the whole book into chapters. You will find this similarity even between books of today printed in this country compared with books of 50 years ago printed in England.

If now you compare drawings made by different men you are pretty sure to find that they are as unlike as two like things can be. From the alphabet of lines to the style of figures and letters, arrangement of views, position and style of title, and drawing number, an almost endless variety.

In any comparison between books and drawings, the books have the better of it, and the reason is not far to seek. The English language and the making of books has been studied as a language, while the making of mechanical drawings has been left to a large extent to the fancy or taste of the individual draftsman.

Not long ago I heard an engineer say, "Some people seem to find it just as difficult to convey a thought in English as some draftsmen do to convey an idea by means of a drawing." The reason is the same in both cases, insufficient knowledge of the language *as* a language.

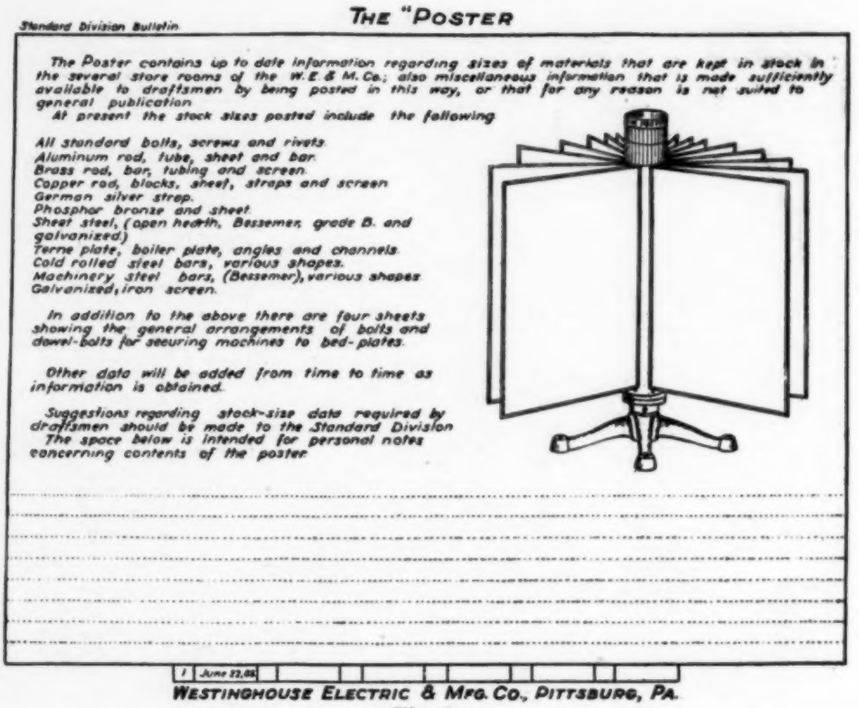
Before an economical study can be made of a language, we must have some kind of standard dictionary. Nearly four years ago, when I first looked into the matter of a drawing system for the W. E. & M. Co., we began with the tracings; the reason for this was that it is prints from tracings that are used in the shop and business of the company, and we wanted to see results as soon as possible. The first thing determined was the alphabet of lines (Fig. 1). Then followed lettering and figures (Fig. 2), and sectioning (Fig. 3). Then came instructions regarding dimensions, dimensioning, finishes and finish marks; then the several mechanical features of a drawing, covering size of sheet, position and style of the title, drawing number, signatures, and several other features peculiar to Westinghouse drawings.

This dictionary is a twenty-page book, and being the foundation of the language, every member of the drafting room is provided with a copy. The immediate result of this dictionary was the cutting out of individual peculiarities in the appearance of tracings made by different men. The 50,000 tracings made since the dictionary was adopted are uniform Westinghouse tracings, and all look alike. In fact, a few days after a tracing has been made, if by any chance the tracer has neglected to put his name on in blue pencil (as is our custom) it is not at all uncommon for several men to claim it as their own work.

It is pretty generally admitted, I believe, by those of extended drafting room experience, that the modern school or college course does not properly prepare a man for actual work in the modern drafting room. Not long ago I read a letter from a young mechanical engineer in which he spoke of "mere mechanical drawing." He probably had reference to the mere making of lines—analogous to the mere thumping of the keys of the typewriter.

A draftsman cannot hope to play the part he should in the modern drafting room until he has educated himself up to his work, which is not merely the making of accurate drawings—although that is an important part of it—but the writing of a language for somebody else to read—and to read, too, without any verbal assistance from him. It must be remembered that the man in the shop is not a mind reader; I have heard it said that a draftsman has to be, but even that does not help the man in the shop. The language itself (and this may be taken as a fairly comprehensive definition) is one of lines, views, and group-signs, and abbreviations, notes and explanatory matter, all for the *positive* conveying of *exact* information to the shop.

A mechanical drawing should contain *all* necessary information, and nothing else; every statement, whether made by means of lines or words or combinations of lines and words, should absolutely be free from ambiguity and as clear and easy to understand as the knowledge and common sense of the draftsman can make it.


THE "POSTER
Standard Division Bulletin
The Poster contains up to date information regarding sizes of materials that are kept in stock in the several store rooms of the W.E.& M.Co.; also miscellaneous information that is made sufficiently available to draftsmen by being posted in this way, or that for any reason is not suited to general publication.
At present the stock sizes posted include the following
All standard bolts, screws and rivets.
Aluminum rod, tube, sheet and bar.
Brass rod, bar, tubing and screen.
Copper rod, blocks, sheet, straps and screen.
German silver strap.
Phosphor bronze and sheet.
Sheet steel, (open hearth, Bessemer, grade B. and galvanized.)
Terne plate, boiler plate, angles and channels.
Cold rolled steel bars, various shapes.
Machinery steel bars, (Bessemer), various shapes.
Galvanized iron screen.
In addition to the above there are four sheets showing the general arrangements of bolts and dowel-bolts for securing machines to bed-plates.
Other data will be added from time to time as information is obtained.
Suggestions regarding stock-size data required by draftsmen should be made to the Standard Division.
The space below is intended for personal notes concerning contents of the poster.
1 June 22,03
WESTINGHOUSE ELECTRIC & MFG. CO., PITTSBURG, PA.
Fig. 8.

There are in the main two sides to the draftsman's knowledge and work: First, How to convey information; second, What information to convey. The college education could easily take care of the first, if only an international standard dictionary were accepted and followed. And in connection with machine construction and design much of the second could be taken care of too, especially that very important part of design that relates to fasteners—means of securing pieces together—as bolts, screws, rivets, pins, keys, nuts, washers, etc. How to specify and convey information about these and other mechanical details and parts that are common to many machines could be usefully taught at college, provided a recognized standard existed. In other words, the college course might be made to prepare a man much more thoroughly than it does for actual work, only leaving his education to be completed in practice, instead of as very often happens now, both begun and completed.

The part of the draftsman's education that properly and necessarily belongs to the drafting room relates to special manufacturing information. In this connection it must be borne in mind that the modern drafting room should be a manufacturing concern, or factory, in itself. The distinction between a factory and a shop is generally taken to be that the work done in the factory is on a larger scale. A better dis-

tinction, I think, is that in the factory things are manufactured systematically and uniformly—not simply made; things can be manufactured in small quantities as well as in large. The modern drafting room then may turn out either many or few drawings. It is modern in the sense of being up-to-date if the drawings speak one good language, instead of a number of dialects, are made systematically, and are uniform as to mechanical features.

The particular drafting room in which I am interested is turning out drawings at the rate of 20,000 a year, and a constant effort is being made to get things down to a manufacturing basis—I mean as to the drawings themselves.

The drawing dictionary once established and the work of the tracers thus brought under control, we turned our attention to the designers, draftsmen and clerical force. This resulted in the formation of a separate department called the Standard Division, for keeping the drafting room posted on Westinghouse practice, preparing forms for the transaction of business, the designing of standard parts of machines, the investigation of standard methods of figuring, and the up-to-date posting of draftsmen regarding stock sizes.

The first thing taken up by the department was the matter of nomenclature, which resulted in a book of element charts and an illustrated index. In general the purpose of the element

In the modern drafting room draftsmen have no time to hunt for dimensions of standard parts. As soon as possible then after a piece becomes standard for general use, every draftsman should be put in possession of its dimensions, so that whenever he wishes to use it he can go ahead promptly and draw it to scale without having to hunt up information.

Every draftsman in the Westinghouse drafting room has a set of 51 sheets containing standard dimensions, and these are being added to every week. The page reproduced in Fig. 6 shows the style in which information of this kind is put up.

Another outcome of the standard division is the Engineers' Note Book. One page is shown in Fig. 7. If there is to be uniformity in design of any apparatus or piece where strength has to be figured, designers must use the same method of figuring, and this method should be thoroughly investigated before being accepted as standard.

So far we have dealt only with what may be called internal information. Quite as important to the drafting room and to the concern itself, because of its influence on profit and loss, is information directly connected with the factory; I refer particularly to stock sizes of manufacturing material.

In modern drafting rooms, whether large or small, draftsmen should be kept thoroughly posted as to the sizes of standard parts kept in stock in the shop store rooms. If this is not

**DESIGNATION OF PIECES.**

IN GENERAL. On drawings the data contained in the designation of a piece should be given in the following order:

1 — NAME, sometimes including dimensions ..... ⅜ Lock washer
2 — DRAWING No., where desirable for reference ..... Dwg. 75498.
3 — MATERIAL, using standard abbreviation ..... C.I.
4 — WEIGHT, in pounds ..... 3350 lbs.
5 — FINISH, when it is not part of standard name ..... N.P.
6 — PIECE No. ..... Pc 2748.
7 — DIE No. ..... Die # 1076.
8 — PATTERN No. ..... Pat. 4832
9 — QUANTITY REQUIRED ..... Req. 32.

EXAMPLES. Liners, # 22 sheet steel, Req. 80.
From ⅜ x 1½ x 5" Hard drawn sheet copper, Req. 1
½ x 6" Tap B., head S.F. & Blued, Req. 27.
⅜ Lock washer, Req. 8
Washer, P# 3471, N.P., Req. 4
⅞ x 1¼" M.B. Tap B., N.P., Req. 32.

PATTERN LIST

| Name | Dwg. | Mat. | Weight | Pat | Req. |
|---|---|---|---|---|---|
| Spider | 83174 | C.I. | 4372 | #4357 | 1 |
| Com. Ring | 34879 | C.I. | 180 | #3796 | 1 |
| | | | | | |

An explanatory or descriptive note added as auxiliary to the designation proper should be placed under the designation so as to leave the "quantity required" at the end of a line, where it is plainly visible after the following manner:

⅜ x 6" Tap B., head S.F. & Blued, Req. 12.
For securing brackets to frame.

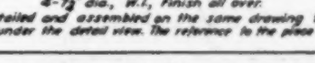
CAPITALS: The above examples indicate when a word should begin with a capital letter. In general, capitalize the first word of a designation, all abbreviations, and the word immediately following an abbreviation.

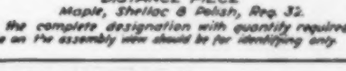
SPECIAL FEATURES: When some special finish is required on a standard or commercial article, it should not be included in the name of the piece, but should be added as a separate and distinct part of the designation. Thus, a tap bolt the head of which is to be semi-finished and blued should not be called a S.F. Tap B., but should be designated after the following manner:

⅜ x 6" Tap B., head S.F. & Blued, Req. 1.

This correct designation means that a ⅜ x 6" tap bolt, taken from stock, is to have its head semi-finished and blued, in other words that work is to be done on a standard article; whereas the incorrect term S.F. Tap B. would not only be indefinite as to meaning but would be equivalent to introducing, unofficially, a new kind of tap bolt.

ON ASSEMBLY VIEWS: A designation should be placed wherever there is clearest room for it, connected to the piece by a pointer, and arranged to suit the space available for it.

Examples:  ⅜ x ⅜ x 1¾ Feather key. Steel, Req. 1.

 ⅝ x 1¾ Mach. B., Req. 6.

ON DETAIL VIEWS: A designation should be placed under and fairly close to the piece, the name itself in capital letters, as a sub-title, and the specification immediately under it.

Examples:
FRONT END PLATE
4-7½ dia., W.I., Finish all over.

DISTANCE PIECE
Maple, Shellac & Polish, Req. 32.

When a piece is detailed and assembled on the same drawing the complete designation with quantity required should be given under the detail view. The reference to the piece on the assembly view should be for identifying only.

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charts is to insure throughout the business of the company uniformity of nomenclature on all drawings, specifications and correspondence. The chart reproduced in Fig. 4 is for the direct current engine type generator. With this in his possession the draftsman at once knows the official name of every element and part of the machine; he knows what pieces should be detailed separately; the halftone of the complete machine tells its own story and so does the sectional assembly drawing beside it. In talking or writing about or designing any one of these elements that go to make up the machine there is no room for misunderstanding as to the meaning of a term. For instance, the element "frame" in this machine includes: frame castings, poles (punchings, side plates, stud bolt and nuts, eye bolts and liners), and so with the other elements.

While settling these matters concerning the names of the principal parts of standard-type machines, we took up the naming of small pieces, as screws and other fasteners, and also much-used parts of machines. The result of this was the Illustrated Index, one page of which is reproduced in Fig. 5. Every draftsman has the complete index and has therefore no excuse for any error in designating any piece included in the index. Of course these books and others that are referred to below grew gradually and are still growing, becoming more comprehensive every month.

done, innumerable unnecessary sizes of these parts will gradually creep into use, which means money locked up in unnecessary stock, and just so much more scrap at the end of every year. This posting should cover stock patterns as well as finished parts and raw materials. It is the duty of a modern draftsman to make a choice from stock unless it is absolutely necessary to introduce a new piece. That is where some of the individuality of the draftsman is passing away. The draftsman needs all the ingenuity as designer and schemer that he ever did—he never needed more—but in the modern drafting room his ability should be directed along the lines that will result in work of the greatest value to the concern. In the Westinghouse drafting room there is a large swing-leaf poster, see Fig. 8 (japanned sheet metal leaves hinged around a rotating vertical column) upon which stock bulletins are secured by means of clips. This poster stands in a place of easy access and can be referred to by several men at the same time, and fills its purpose admirably, containing up-to-date information regarding sizes of materials that are kept in stock in the several shop store rooms of the company; also miscellaneous information that is made sufficiently available to draftsmen by being posted in this way.

Information regarding existing patterns, dies and tools, etc., is carried for the most part in card indexes.

In every drafting room the chief draftsman finds it necessary from time to time to issue instructions; some to the drafting room as a department, others to the divisions of the department. These instructions frequently emanate from the officers of the company, and affect standard practice. Whatever they may be, if they are instructions for permanent following they must be in writing, must be read by all concerned and not forgotten; in other words, these instructions must be carried out at all times.

In the Westinghouse drafting room instructions of this kind are issued as circular letters; the complete book of them at the present time is a volume of about 400 pages of type-written matter, the whole being duplicated six times for reference in different parts of the room.

It is perhaps needless to say that it is practically impossible for any man to remember so many instructions of so varied a character, and quite out of the question for a draftsman to wade through a volume of 400 pages to look up doubtful points of practice. The solution of this has been found in what we call the "Circular Letter Digest." This is a printed book of some 30 pages (and every draftsman has a copy of it), in which the instructions are classified according to the subject they bear upon, and in which the substance of each letter has been "boiled down" or "digested" into the smallest number of words consistent with intelligibility, frequently a single line taking the place of a long letter. One of the happy results of having information for draftsmen put together in concise and intelligent form is the ease with which it is possible to break in new men.

Reference has been made to the dividing of the drafting room force into designers and draftsmen, tracers, checkers and clerks. In a large concern like the Westinghouse company, where there is a drafting room force all told of about 350, these divisions are more distinct than in small concerns, but they always exist to some degree and all members of the force must be kept in line. The clerical part of the work must be done on forms prepared for the purpose, so that all records may be quickly made and correspondence with other departments be official in character and uniform in style.

The drafting room (speaking now in general) has been grossly neglected in matters of form and methods of procedure. While the executive end of business has been fully equipped with printed forms for the transacting of every detail of its work, the drafting room has been generally expected to make what it can of blank sheets of paper for drawings and a scratch pad for correspondence. This is not as it should be and in the modern drafting room it is a condition that is rapidly disappearing.

Even the checker, who is generally considered as sufficient unto himself and to have occult powers, should work systematically. The checking of drawings is of vital importance; mistakes are not mistakes until after they have eluded the checker's eye; the drawing, like the machine, is not ready for delivery until after it has been tested and inspected.

In the Westinghouse drafting room there is a large force of checkers and one inspector. The checkers are expected to follow the above advice. Draftsmen also are provided with the instructions and it is their business to make drawings so that they will check up in accordance. Just how these instructions were arrived at may be of interest. One of the most systematic of our checkers was asked to give his ideas on the subject. A copy of his ideas was then handed to every checker in the room, with a request for other ideas; which after being sifted to the bottom resulted in the instructions as above.

The note, "You must know what is wanted before you go ahead with any checking," is an important reminder that speaks for itself. Every drawing after being checked is handed to the inspector, whose special duty it is to catch all deviations from standard in matters relating to the drawing considered as the writing of a language, and under whose advice all records are made (generally on specially-ruled index cards) of such patterns and much used pieces as draftsmen may wish to refer to in connection with future designs.

In general, information to draftsmen belongs to one of two classes: It is either standard or special. Under standard we have in the Westinghouse drafting room the Drawing Dictionary, Element Charts, Illustrated Index, Circular Letter Digest, Example Drawings, and Abbreviations—six books, bound in one cover, with index, and called the Standard Book. Every checker, draftsman and tracer has his standard book, the contents being suited in a general way to the work of the man. Under special information are included records that have to be kept up to date. In general no attempt is made to post draftsmen individually on information of this kind, it being made as available as possible in other ways, as by card indexes and record books.

In conclusion I would like to point a moral: The mechanical draftsman will be a greater force and will the sooner gain that recognition he so frequently cries out for, when he ceases to permit his work to be the mere making of lines, and succeeds in elevating it to a higher plane—the writing of an exceedingly comprehensive and practically universal language. I have heard apparently intelligent men discuss for hours and throw fierce invectives in vain attempts to convince one another that such and such a way of filing drawings is better than any other;

## CHECKING DRAWINGS.*

The following is intended as a guide when checking drawings. Each numbered feature should be taken up separately for any drawing or set of drawings (generally in the order given), and as each item is taken up it should be done thoroughly and as far as possible completed before passing on to the next. Every dimension, etc., should be ticked off with blue pencil as it is checked, and each feature checked off on Form 378534 as a record both of what has been done and what remains to be done.

1 – See that the drawing is made in accordance with the Westinghouse standard drawing system, and with the nearest related element chart. This part of the checking should cover the general contents of the drawing, information for Specification Department, names of pieces and title of drawing.

2 – Check all dimensions by scaling, and, where advisable, by calculation also.

3 – See that each piece is correctly drawn, independent of dimensions; and that all necessary views are shown, but none that are not necessary.

4 – See that dimensions for the shop are given as required by the shop; that is, that the shop is not left to do any adding or subtracting in order to get a needed dimension. Give due attention also to dimensions that are specially for the Specification Dept. or for future reference in the M. E. Dept.

5 – Go over each piece and see that finishes of every kind are properly indicated or specified.

6 – See that every specification of material is correct and that all required specifications are given.

7 – Check the pattern list with the patterns shown on the drawing, and with the pattern book in Standard Division, and also with similar patterns as tabulated in card indexes, etc., to make sure that no new patterns are ordered when old patterns already exist. Check Piece #s and Die #s.

8 – Compare with previous drawings of similar apparatus.

9 – Look out for interferences; this means check each detail with the pieces or parts with which it is to be assembled, and see that proper clearances have been allowed.

10 – When checking for clearances in connection with mechanical movements, carefully lay out the movement to scale, figure the principal angles of motion, and see that proper clearances are maintained in all positions.

11 – See that all the small details, as screws, bolts, keys, pins, rivets, wires and cables, insulations, etc., are according to our standard, and that where possible stock sizes are chosen.

12 – In a general way review the drawing in its entirety in connection with any points that have suggested themselves during the above checking; and bear in mind all the information given in the following standard data books: Drawing Dictionary; Standard Dimensions; Stock Sizes; Example Drawings, Name Plates and Name Plate Charts; Element Charts; Finish Charts; Abbreviations; Illustrated Index; Hand Wheels; Flexible and Flange Couplings; Pulleys; Process Book, and all information available in the Standard Division.

13 – Check every feature of the title and record strip.

14 – Attend to all entries and correspondence in any way connected with the drawing.

15 – See that all lines and figures are heavy enough to make good Brownies.

* You must know what is wanted before you go ahead with any checking.

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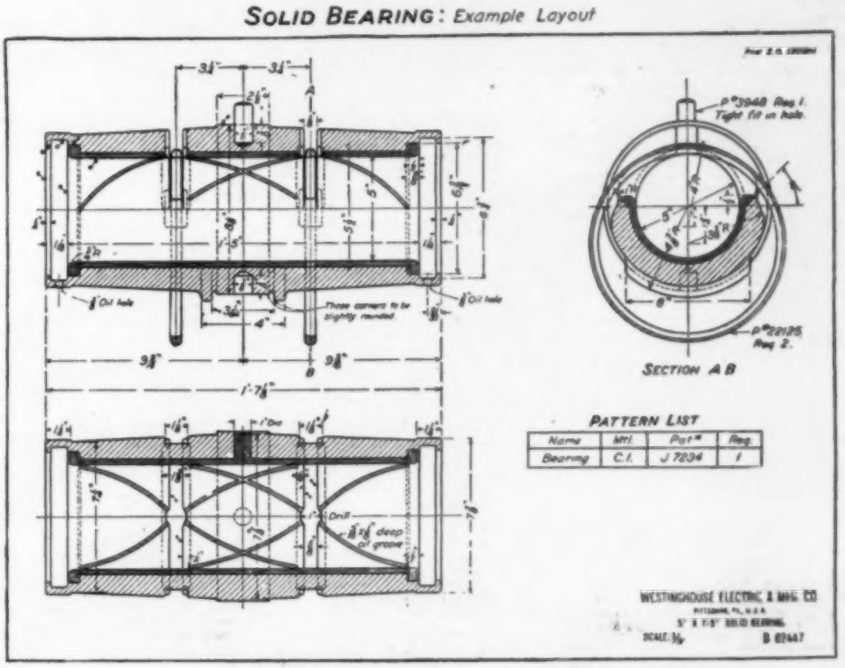
that the dull side of tracing cloth is better than the smooth side, or vice versa; that patterns should be numbered in this way and not by any manner of means in that way; that original pencil drawings should always be carefully preserved, or officially destroyed as soon as the tracing is complete; that the bill of material should be in such a place on the drawing, or not on the drawing at all; that there should positively be a margin of one-half of an inch around every drawing; that the size of a drawing should be so much by so much, even according to the law of the Medes and Persians; and so on, ad libitum.

Surely all these things have been written about and talked about often enough to prove conclusively that it is waste of time to do either any more. It is as well to remember the old saying, "What is food for one may be poison for another." Let each drafting room, guided by a little common sense, settle these and similar things for itself, and then go ahead and write the language in such a way as to convey exact information clearly and concisely according to our definition; let the aim of those in charge of draftsmen to be to keep them thoroughly and systematically posted; let every draftsman make it one of the essentials of his work to become familiar with shop practice and with everything that the firm he is with has already made or carries in stock or is accustomed to buy,

**SOLID BEARING:** *Example Layout*




WESTINGHOUSE ELECTRIC & MFG. CO. PITTSBURG PA.

and let his aim be to produce drawings that tell the shop clearly everything that the shop needs to know; let the draftsman do these things and he will get his reward.

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In spite of all the recent strikes, building operations for the month of August show an increase over the corresponding period a year ago of practically 12 percent. Permits were taken out in August in twenty-two of the principal cities of the country, according to special reports to Construction News, for 6,389 building improvements aggregating $25,533,322, against 5,674, aggregating $22,831,810 for the corresponding month a year ago, being an increase of 715 buildings and $2,701,512 or practically 12 percent. Atlanta made the largest gain, 357 percent; and Allegheny the largest loss, 42 percent. New York gained 31 percent, and Brooklyn 120 percent. Buffalo gained 70 percent.

---

The Le Baron Iron Foundry, Middleboro, Mass., is negotiating for a lease of a part of the Billings-Clapp property at Mt. Hope Bay, R. I., as the company desires to have a location on tidewater and on the New York, New Haven & Hartford Railroad.

## VALIDITY OF CONTRACTS TO QUIT BUSINESS.

Judge R. S. Frazer in common pleas court at Pittsburg, Pa., last week handed down a decision in the suit of the Standard Sanitary Mfg. Co. against James W. Arrott, a former stockholder, which restrains him from manufacturing and selling bath tubs and sanitary appliances. The plaintiff is a corporation of New Jersey, and represents an association of a number of plants manufacturing plumbing supplies. The combine absorbed the Standard Mfg. Co., of Pittsburg, which was owned by Francis J. Torrance and James W. Arrott, Sr., and the members of their immediate families. When the consolidation took place in 1899, most of the stockholders signed contracts not to enter into competition with the corporation for a period of 10 years.

James W. Arrott, Jr., has recently engaged with others in the manufacture and sale of goods of a similar character to the output of the corporation at Monaca, Pa. The death of James W. Arrott, Sr., caused his name to be withdrawn from the bill. The defendants contended that the contracts were invalid on the ground that they were in restraint of trade; that they set forth no consideration, and because the plaintiff company had not fulfilled its part of the contract. Judge Frazer says in part: "While it is true that the courts of both this country and England generally regard contracts in restraint of trade to be against public policy, and therefore void, the strict rule originally adhered to has been gradually modified and relaxed, so that the law is, at present, that a trade contract is valid and binding if the restraint be particular in respect to time and place and supported by a sufficient consideration."

After reviewing the facts in the case the court says: "Under these circumstances, considering the nature of the business and the extent of the territory covered, it seems clear to us that the service contract executed by defendant is reasonable, both as to time and territory."

---

The abrogation of the Dominion Coal Co. lease by the Dominion Iron & Steel Co. and the securing by the latter company of about $3,000,000 from the former company for moneys expended by the steel company upon the coal property, and as a bonus for giving up the lease, will leave the Dominion Iron & Steel Co. with a floating debt of about $2,000,000, as against a previous debt of $4,800,000. The subscribers to the $1,500,000 second mortgage bonds will take the bonds and the proceeds will provide the necessary funds to complete all construction work.

## IMPROVED 17-INCH ENGINE LATHE.

This lathe has been remodeled and is built from new patterns, with all modern improvements, and is equally well adapted to the handling of either light or heavy duplicate work. The head stock is massive, webbed its entire length, and not weakened for reverse plate. The spindle is made of crucible steel with a 1 7-16-inch hole the entire length. The bearings for the spindle are of composition metal, and are massive both front and back. The spindle is ground round and true. The thrust-collars are steel, hardened and ground. The cone has five steps for 2½-inch belt, and is strongly back-geared. The tail stock is massive and reamed for No. 4 Morse taper.

All feeds are reversed in the apron, and so arranged that it is impossible to throw in the rod and screw feeds at the same time. The carriage has bearing on each side of the V's, having a bearing its entire length on the two outside V's, and is locked for cross-feed work by an eccentric clamp from the front, which performs the work without any twist or side strain. The friction cross-feed is graduated to one-thousandths of an inch, and is so constructed that if the cross-feed is allowed to run beyond its limit no harm will be done. The compound rest is substantial and both upper and lower slides are fitted with taper gibs. The geared feed being positive, all feeds are obtainable within the range of modern practice and without using the lead screw. There are also four changes of belt feed, and feeds can be driven with belt or gearing, without disconnecting either. Both the cross and length feeds can be operated at the same time. Threads, from 2 to 48 per inch (including 11½), can be cut without changing gear on spindle. Right or left threads can be cut, without changing any gears, by simply reversing the lever shown at end of head stock.

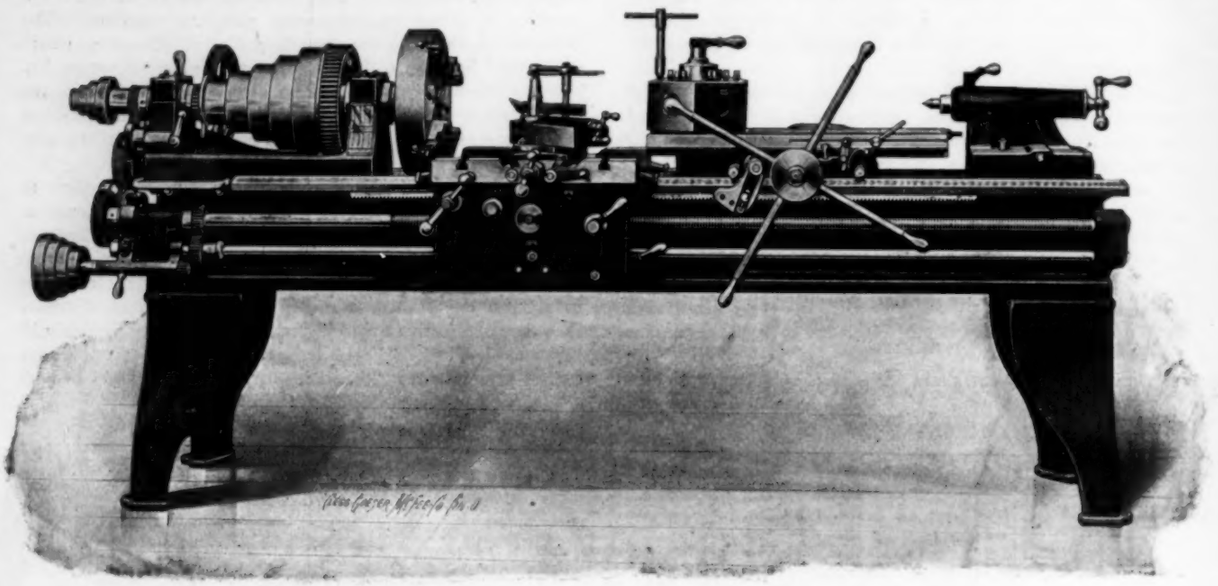


FIG. 1.—17-INCH ENGINE LATHE, WITH AUTOMATIC TURRET.

An especial feature of the lathe is the arrangement of the power feed automatic turret. This is of massive construction and in addition to the feed cone changes has three changes of feed directly under control of the operator on the front side of turret, by means of a lever conveniently placed next to the pilot-wheel.

The countershaft has friction pulleys which can be oiled without throwing off the belt. The friction pulleys run in a forward direction, as the index dial on carriage connected with the lead screw takes care of all thread cutting, there being no need of reversing the lathe.

The lathe is built by Greaves, Klusman & Co., of Cincinnati.

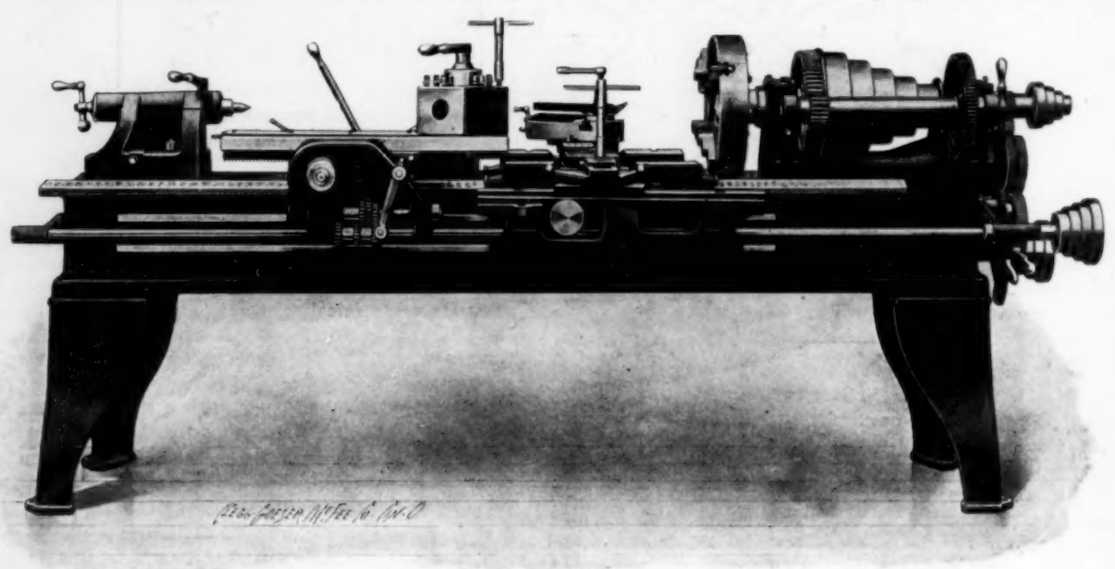


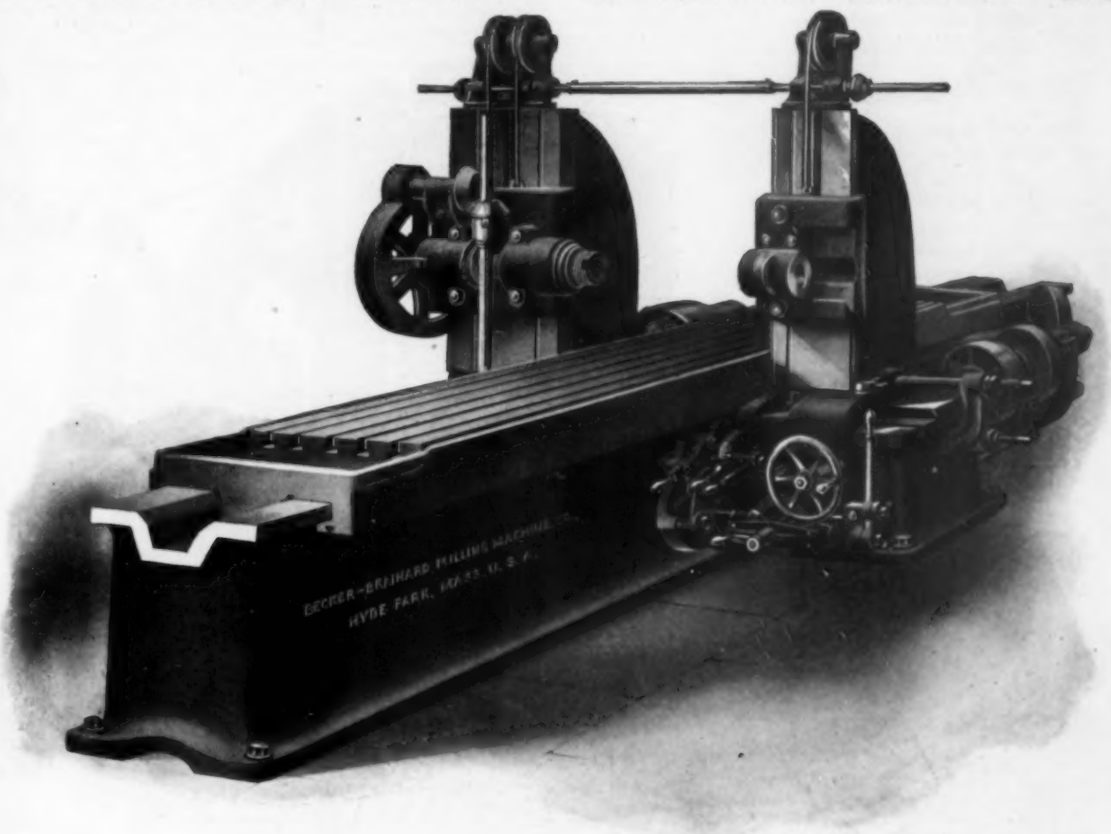
FIG. 2.—REAR VIEW OF 17-INCH LATHE.

A petition in involuntary bankruptcy has been filed against the Gordon Foundry & Machine Co., of St. Joseph, Mo.

## PLANER TYPE MILLING MACHINE.

The Becker-Brainard Milling Machine Co. of Jamaica Plain, Mass., has a new milling machine of the planer type. The machine has a capacity of 32 inches by 26 inches by 10 feet. The spindle is made of hammered crucible steel, 5 inches in diameter, has a threaded nose and runs in self-centering bronze boxes with nut and check nut to compensate for wear. The spindle carrier is very heavy and is held firmly to the upright by long gibs. It is elevated by a screw with adjustable dials graduated to thousandths of an inch and has a counterbalance for ease of operation. There are twenty changes of speed for the cutter spindle and these are obtained by gearing in the main driving cone. These are operated by clutch and lever and all changes can be made instantly.

The table is heavy and is regularly built with five T slots lengthwise and an oil channel the full length and at each end. It travels on flat ways securely gibbed and has a quick return movement operated by power from a separate counter-




A NEW MILLING MACHINE.

shaft. The table can also be moved by the usual hand wheel. The feed of the table is directly connected through gearing from the spindle at ratios of 13½ and 27 to 1 by 5-inch belt on a 5-step cone, the diameter of which is 23 inches on the largest step and 13 inches on the smallest, giving a range of feed through eight changes from 3-64 to 3-8 inch. These changes of feed can be made promptly by means of a lever and without stopping the machine.

The head may be adjusted from either side of the machine, so that it is not necessary to take the cutters off the arbor in order to change their position in relation to the work.

The bed is extra deep, extending to the floor and making a solid foundation. It is securely braced by heavy cross girders which are evenly spaced throughout the entire length. The bed can be made any length desired. The working surface of the platen is 120 inches by 26 inches. The longitudinal feed is automatic in both directions to 120 inches. The greatest distance from center of spindle to table is 28 inches, and the least is 2 inches. The greatest distance from end of spindle to tail stock spindle is 37 inches, and the least distance from end of spindle to tail stock spindle is 17 inches. The net weight is 25,000 pounds.

## WESTINGHOUSE ELECTRIC & MFG. CO.

The New York Stock Exchange has listed $4,500,000 additional assenting stock of the Westinghouse Electric & Mfg. Co., this being in addition to the $4,635,200 listed on Sept. 3. The total amount listed is $18,526,000. . The net earnings for the first three months of the fiscal year ending June 30, 1903, were $1,137,734.11, or at the rate of 18.2 percent per annum on the entire $25,000,000 capital. The balance sheet as of June 20, 1903, was as follows:

### Liabilities.

| | |
|---|---|
| Cash | $ 1,759,928 81 |
| Bills receivable | 1,830,770 13 |
| Accounts receivable | 8,183,693 14 |
| Material in stock | 7,509,743 81 |
| Material on consignment and exchange | 436,424 90 |
| Real estate, etc. | 4,973,948 26 |
| Machinery, tools, etc. | 2,838,301 14 |
| Stock in sub-companies | 4,013,363 46 |
| Stocks and bonds | 3,238,019 81 |
| Cleveland plant | 546,142 60 |
| Patents, charters, etc. | 5,019,680 99 |
| Miscellaneous | 199,630 13 |
| Total | $40,849,647 18 |

### Assets.

| | |
|---|---|
| Capital stock liability— | |
| Preferred stock (79,974 shares) | $ 3,998,700 00 |
| Assenting stock (280,535 shares) | 14,026,800 00 |
| Common stock (73 shares) | 3,650 00 |
| (In treasury, 139,417 shares.) | |
| Surplus | 8,812,399 90 |
| Accounts payable | 2,583,663 33 |
| Bills payable | 5,302,500 00 |
| Contract and funded liabilities— | |
| Debenture certificates | 2,787,000 00 |
| Total | $37,514,713 23 |
| Payments received on account | 3,334,933 95 |
| Total | $40,849,647 18 |

The original amount of the debentures was $3,500,000, of which $500,000 have been retired and $113,000 purchased for retirement. The payments received on account are in part payment of the 90,000 shares issued Sept. 14 at $80 per share.

The growth of the Westinghouse Co. can best be shown by

the following figures, showing the gross earnings of the company for the past four fiscal years: 1900, $12,793,703; 1901, $15,833,481; 1902, $19,975,958; 1903, $23,899,492.

The balance sheet of the company shows some interesting changes, as compared with the last one issued in 1899, as follows:

| | Increase. | Decrease. |
|---|---|---|
| Cash | $1,014,753 | $ ..... |
| Bills receivable | 1,424,670 | ..... |
| Real estate, etc. | 3,092,582 | ..... |
| Material in stock | 4,480,159 | ..... |
| Do on consignment | 736,424 | ..... |
| Real estate, etc. | 3,002,582 | ..... |
| Machinery, tools, etc. | 1,214,931 | ..... |
| Stocks and bonds | ..... | 2,029,218 |
| Cleveland plant | ..... | 330,245 |
| Patents, etc. | 227,499 | ..... |
| Miscellaneous | ..... | 400,320 |
| Preferred stock | 1,950 | ..... |
| Assenting stock | 4,664,044 | ..... |
| Assenting stock | 3,334,933 | ..... |
| Common stock | ..... | 91,750 |
| Debentures | ..... | 613,000 |
| Accounts payable | 1,656,821 | ..... |
| Bills payable | 4,076,500 | ..... |
| Accrued interest | ..... | 14,583 |
| Construction and funded debt liabilities | ..... | 112,787 |
| Surplus | 6,093,172 | ..... |

A comparison of net earnings shows:

| | |
|---|---|
| Net for four months, ending July 31, 1899 | $ 558,431 |
| Net for three months present fiscal year | 1,137,734 |

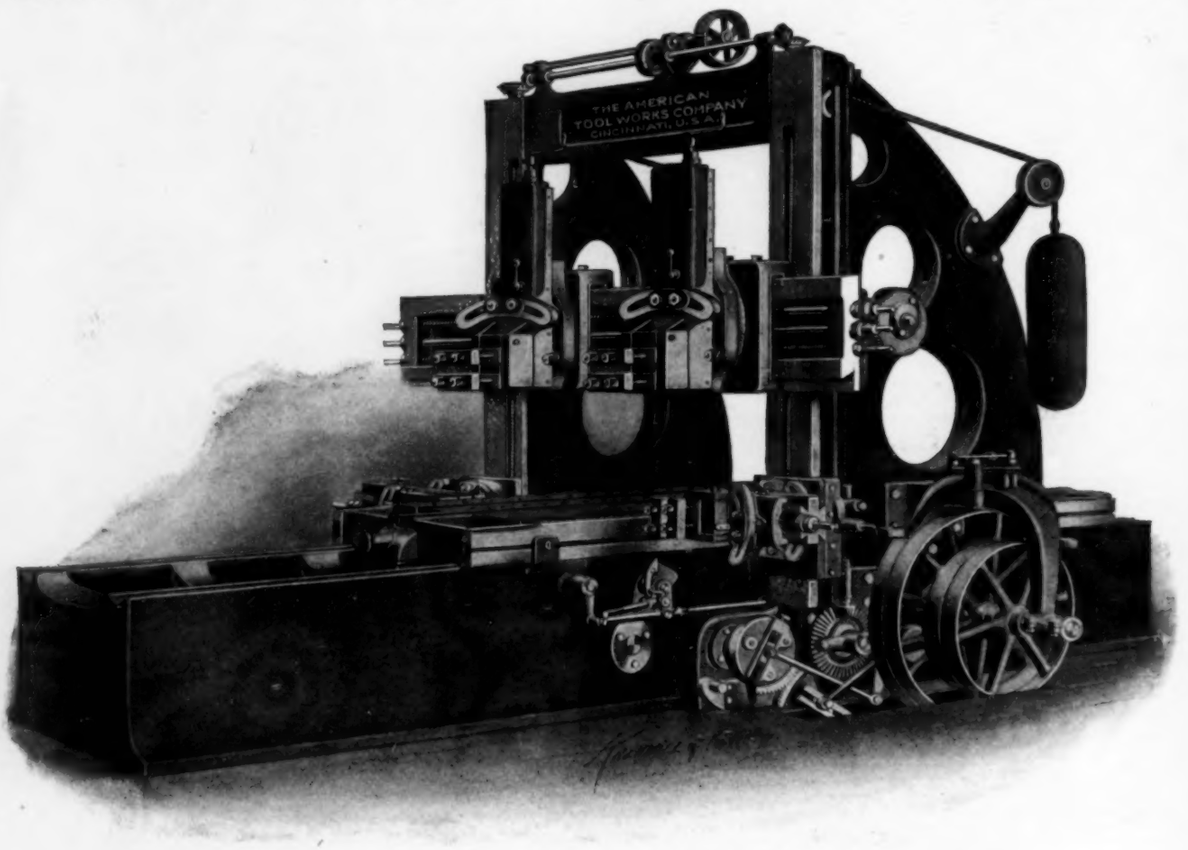
In calculating the percentage of earnings for the past four years, the following figures are taken:

| | |
|---|---|
| Increase in surplus for four years | $ 6,093,172 |
| Bonds paid from earnings | 613,000 |
| Charged off Cleveland plant | 330,245 |
| Charged off miscellaneous account | 400,320 |
| | $ 7,436,737 |
| Average per year | 1,859,184 |
| Assenting stock outstanding, 1900 | 9,362,756 |
| Assenting stock outstanding, 1901 | 9,362,756 |
| Assenting stock outstanding, 1902 | 13,933,256 |
| Assenting stock outstanding, 1903 | 14,926,800 |
| Average | $11,671,342 |

Earnings over dividends averaged 15.9 percent per year.

## NEW 42-INCH AND 48-INCH PLANERS.

The illustration represents the new 42-inch and 48-inch planer of the American Tool Works Co., of Cincinnati. This firm has lately redesigned its entire line of planers, from 22 inches to 48 inches, with the purpose of adapting them to the greatly increased duties imposed by modern shop practice. Every condition influencing modern planer work has been given careful consideration, and, in practice, the increased efficiency of the planer, and its adaptability for use with high-speed steels have been most satisfactory. Strength and rigidity have been foremost aims in the new designs. The bed accordingly has been made unusually heavy, extra wide between the V's, and thoroughly braced by heavy box cross-girts at short intervals. The central portion, where the gears are mounted, and the strain is heaviest, is strongly reinforced. The bed is of unusual length in proportion to the table, leaving but little overhang to the table when planing at full length. The table has ample thickness, and the driving mechanism is provided with improved shifting mechanism, which removes the belt from one pulley, before the return movement belt engages the other, thus obviating all disagreeable sound from slipping belts.




AMERICAN TOOL WORKS CO.'S NEW PLANER.

A safety locking device prevents the table from starting before the operator is ready. The table can be run from under the tool for examination of work. Housings are double-webbed, cored-section type, with wide bearings for cross rail, fitted parallel with each other and square with the table. The cross rail has wide bearings for the heads and is raised and lowered rapidly by power. The heads on the rail are made right and left to permit of planing close together. Saddles are graduated for angular planing. Feeds are automatic in all directions, and can be operated from either side of the machine.

The down feed is of exceptional length, and equipped with micrometer adjustment. Side heads are of the compound slide type, giving the tool exceptional range of travel; they are counterbalanced and can be run below the level of the table when not in use. All pinions are of steel; the shafts are crucible steel of large diameter, and each shaft with all its parts can be readily removed when necessary without disturbing the rest of the machine. All gears are cut from the solid, are coarse pitch and wide face, and all gearing is located on the inside of the bed.

## THE MANUFACTURE OF SEAMLESS BOILER TUBES.*

BY LIEUT. NEWTON MANSFIELD.

The material should be mild, open-hearth, basic steel taken from the bottom half of the ingots and received at the tube mill in round bars of from 3-in. to 4-in. diameter, and from 8 feet to 10 feet long, having an average tensile strength, 52,400 pounds per square inch; average elastic limit, 30,400 pounds per square inch; average elongation, 25 percent in 8 inches; and average reduction of area, 56 percent. The approximate chemical composition is: Carbon, .17 percent; manganese, .45 percent; sulphur, .025 percent; phosphorus, .01 percent.

The manufacture of the tube is comparatively simple, yet of such a nature that none but the best product should finally reach the finished state. The process may be divided into two parts, viz.: (1) The hot treatment; (2) the cold treatment.

### Hot Treatment.

The round bars of steel are heated to a cherry red in a closed gas furnace, and are sawed at this heat, by a circular saw, in length commensurate with the required length of the finished tube. These sawed lengths are not allowed to cool, but are immediately put into another closed gas furnace and heated to a light-yellow heat. This second heating is gradual, the time required being from 20 to 40 minutes. The distillation of bituminous coal is used as the gas for heating. The "billets," as the sawed lengths are now called, are placed in the coldest part of the furnace and rolled from time to time in the hottest part, so that every part of the billet may have the same temperature. The billets upon reaching the required temperature are taken out and delivered to the piercing mill, the principle of which is shown in Fig. 1. It consists of two discs of cast steel carried on the ends of two shafts whose

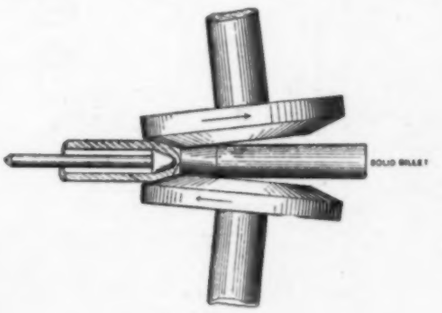


FIG. 1.

center lines lie in the same horizontal plane, but slightly inclined to each other. The shafts revolve in opposite directions and make 120 revolutions per minute. The faces of the discs may be brought nearer to each other or separated by adjusting screws to accommodate billets of different diameters.

The billet in its yellow-heat temperature is laid on a small guide between the faces of the discs so as to bring the axis of the billet in the same horizontal plane in which the axes of the discs lie. The billet is then pushed by hand until its forward end takes against the revolving discs. The principle of the belt climbing to the high side of the pulley forces the billet on to the piercing point, which is shown in Fig. 1.

The piercing point pierces the billet while the beveled surfaces of the discs roll the pierced billet out smoothly as it advances over the piercing point. The piercing point and its mandrel are firmly supported so that the piercing point enters the center of the billet. This is not held rigidly in place, however, but is allowed to revolve with the billet. Its rear end is held in a swivel amply strong to take the thrust of the advancing billet. After each billet is pierced, the piercing point and its mandrel are dipped in cold water to lower their temperature. (Both discs are constantly cooled by a stream of cold water.) The piercing point is made of the hardest steel. The piercing of a billet is a severe test of the homogeneousness of the material.

The range of temperature within which a billet must be pierced is very small. If the metal is too cold, the billet is sometimes torn or will stop the mill; or if too hot, the resulting tube may be very rough and contain injurious spiral twists. If the temperature is just right and the billet is in every respect a good one, it goes through the mill smoothly, coming out with a central longitudinal hole, fairly smooth on the inside and carrying considerable millscale on the outside surface.

The billet is now about twice its original length. It is not allowed to cool, but is passed immediately through the rolls. The rolls are the ordinary cast iron rolls used in steel mills, but as the tube is rolled it is made to slide over a mandrel, whose point is held between the rolls. Should the "tube," as it is now called, cool too much for rolling, it is placed in a convenient furnace to receive the proper heat, but this is not done except in very long tubes that cannot be rolled with the one heat of the piercing mill. The tube is given from four to eight passes through the rolls, care being taken that the tube is turned through about 90° after each pass, in order that the walls may be rolled of even thickness. The tube is now about four or five times the length of the original billet, and has a wall of about ¼-inch in excess of the required thickness in the finished tube, while the excess in diameter over the finished tube is about ½-inch. There is little or no millscale on the inside, but considerable on the outside. This ends the hot treatment.

### Cold Treatment.

The tube, coming from the rolls with a fairly smooth surface on the outside and a smoother surface on the inside, is allowed to cool to the temperature of the air. It is then pointed. This is done by heating one end of the tube for a length of about 1 foot and crushing from 6 inches to 8 inches of this heated end in a pneumatic hammer, forming a point so that the end of the tube may be started through a die of smaller diameter than the tube. This die is shown in Fig. 2. This point serves as a gripping surface for the pliers which

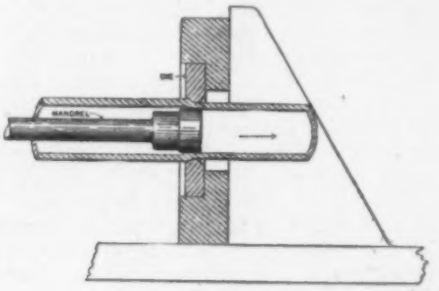


FIG. 2.

pull the tube through the die. The tube, having been pointed, is taken to the pickling-room and immersed in a hot, though weak, solution of sulphuric acid. This pickling removes the scale. After this immersion in a bath of hot sulphuric acid the tube is immersed in a bath of fresh water, which washes away the loosened scale. The tube is then immersed in a mixture of tallow and paste, the paste being made of flour and hot water. This last operation is called "doping." After "doping" the tube is dried for about five minutes in a hot oven. The tube is now ready for the cold-draw bench room.

### Cold Drawing.

The principle of the draw bench is shown in Fig. 2. The tube at its pointed end is closed, but the other end is open. Into the open end the mandrel is shoved until the mandrel takes against the pointed end on the inside of the tube. The mandrel is carried on one end of a long rod, the other end of which is secured to the draw bench to hold the mandrel in its proper position relative to the die. The pointed end of the tube with the mandrel on the inside is now passed into the die and the drawing pliers are made to grip the point. They work on the principle of ice tongs. Toes on the pliers engage in an endless sprocket chain which, traveling at the rate of 10 feet per minute, slowly draws the tube through the die. The tube having passed through the die is reduced in diameter, being reduced in thickness and lengthened about 20 percent. Both inside and outside surfaces are smooth, almost polished.

The effect on the tube undergoing the process of cold drawing is good evidence of the quality of the material. If the material be of meagre ductility the tube will tear in two, and if the material be not homogeneous, it will show in the surface

*Abstract of paper in Journal of Society of Naval Engineers.

as spongy spots, checks, or small transverse tears. It will be noticed that the mandrel in Fig. 2 has no side support other than the metal of the tube. By reason of this, hard spots easily displace it in drawing which show up on the inside surface. The tube is always drawn beyond its elastic limit. After the tube has made one pass on the cold-draw bench it is annealed in an open furnace which uses the distillation of bituminous coal as a source of heat. The temperature of annealing is that of cherry red, but may be so regulated as to affect the ductility and tensile strength within certain well-known limits. The tube, having reached the required temperature, is taken from the oven and allowed to cool in the air, after which it is again pickled and immersed in the mixture of "dope," and dried. It is now ready for a second pass on the cold-draw bench.

The number of times a tube is drawn on the cold-draw bench depends on (1) the thickness of the wall of the finished tube; (2) the tensile strength of the material of the tube; (3) the tensile strength of the rod holding the mandrel in its relative position to the die.

It is seen that in the cold drawing the pliers tend to pull the tube apart at the die, causing a tensile stress at the die which must be resisted by the tensile strength of the material in the tube. The ability of tubes to resist this tensile stress is manifestly greater in tubes of thick than thin wall, considering the area of the cross section of the tubes as a resisting surface. It must not be forgotten that, as the tube is drawn through the die, and the metal is "sunk" around the mandrel, the friction between the inside of the tube and the mandrel tends to pull the mandrel through the die. This is resisted by the tensile strength of the mandrel rod.

In reducing a tube from a larger to a smaller diameter and from a thicker to a thinner wall, it must be borne in mind that required reduction must not be obtained by a pull equal to the tensile strength of the tube; and, further, the friction between the inside of the tube and the mandrel must be less than the elastic limit of the mandrel rod. If these two conditions are fulfilled the tube may be drawn safely.

Large tubes of thick wall, therefore, do not require so many passes on the draw bench as tubes of smaller diameter and thinner wall. For instance, 2-in., 8 B.W.G. receive but two passes on the cold-draw bench. In the first pass the diameter is reduced from 2½ inches to 2 3-16 inches, while the wall is reduced from 5-16-inch (.3125 inch) to 7-32-inch (.21875 inch). The second pass further reduces the diameter from 2 3-16 inches to 2 inches, and the wall from 7-32 inch (.21875 inch) to 8 B.W.G. or .165 inch. A tube of 1 inch diameter and 11 B.W.G. requires at least five passes. The reductions of diameter are from 1½ inches to 1⅜ inches, 1¼ inches, 1 3-16 inches, 1⅛ inches, and 1 inch respectively, while the five passes reduce the thickness of the wall at the same time to the following dimensions, viz.: from ¼-inch (.25 inch) to 7-32-inch (.21875 inch), 3-16 inch (.1875 inch), 11-64 inch (.171875 inch), 5-32-inch (.15625 inch), and 11 B.W.G. (.120 inch). Then follow inspection, hydraulic test under 1,000 pounds pressure, retort annealing, and final inspection.

### Strength of Aluminum Bronze.

In answering the inquiry of a correspondent who wants a copper alloy giving a higher tensile strength than manganese bronze, Government specifications, which call for 72,000 pounds per square inch, the *Metal Industry* says: "Among the common alloys, manganese bronze is undoubtedly the strongest alloy, although it is difficult to always obtain the high tensile strength. Aluminum brass, composed of copper 63.33 percent, zinc 33.33 percent, and aluminum 3.34 percent, has given over 80,000 pounds per square inch in sand castings but is more difficult to cast on account of its greater shrinkage.

"Undoubtedly the strongest known copper alloy, although not a bronze, is one composed of copper 63.33 percent, nickel 33.33 percent, and aluminum 3.34 percent. From 95,000 to 100,000 pounds per square inch may be obtained in castings."

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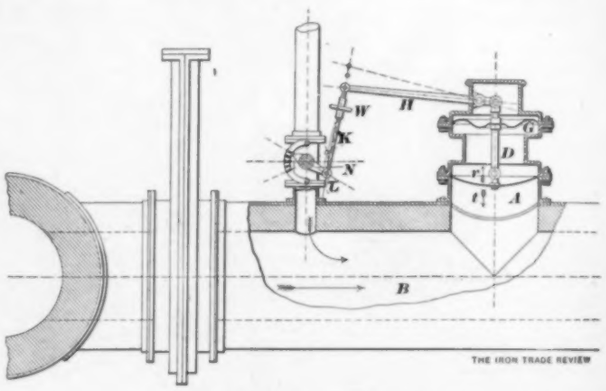
The Erie Railroad Co. has opened an industrial department at 21 Cortlandt St., New York, under the direction of Luis Jackson, industrial commissioner, to further the industrial development of the territory traversed by the railroad.

### SELF-ACTING HOT BLAST REGULATING VALVE.

This device, the invention of John L. Stevenson, of 39 Victoria street, Westminster, London, is designed to regulate the heat of the blast supplied to a blast furnace. It is made self-acting by means of an expanding plate which by a combination of levers opens a throttle valve admitting more or less cold air to intermix with the heated blast, the plate expanding or contracting as the heat rises or falls.

The valve, which is shown in the accompanying illustration, comprises a slightly dished plate A which is exposed to the action of the heat of the blast as it passes beneath it along the tube B in the direction shown by the straight arrow. The action of the heat upon the plate A causes a concentrated expansion towards its center, which raises the crown of the arched plate in the direction of the small arrow *t* and depresses the short end of lever H, consequently raising the longer end of the lever, which, being connected by the rod K to the small lever L of the throttle lever, opens the latter more or less, according as the heat causes more or less expansion in the plate A. The opening of the throttle admits cold air into the tube B which intermingles with the already present hot blast, thus reducing the temperature, and this reduction of temperature causes the plate A to contract and move by this contraction in the direction of the arrow *r* acting through spindle D, lever H, rod K, and small lever L upon the throttle valve N which it closes, stopping or reducing the admission of cold air until the blast temperature again rises, when the same action




HOT BLAST REGULATING VALVE.

is renewed. The spindle D passes through a corrugated diaphragm plate G, which acts as a support to the end of spindle and prevents escape of blast and a chilling action upon plate A. These valves may be placed in any position, either vertically or horizontally, to suit existing tubing. The valve is regulated and set to any temperature by the hand wheel *w*.

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The Mossberg & Granville Co., Providence, R. I., which recently failed, will be reorganized. After the failure the business was bought by John T. Maguire, who acted for men who will organize the new corporation to carry on the business. The manufacture of wire drawing machinery will be abandoned, and the company will engage in the manufacture of jewelry machinery and roller bearings. The shops are now being overhauled.

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President W. F. Donovan, of New York; T. I. Crane, of Pilling & Crane, of Philadelphia, and other directors of the Eastern Steel Co., made an inspection of the Pottsville, Pa., plant last week. The company will start four open-hearth furnaces, with a capacity of 100,000 tons yer year, on Jan. 1.

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The Ingersoll-Sergeant Drill Co., will double its present facilities for manufacturing in the pneumatic tool department. This enlargement is necessary on account of the increasing demand for the Haeseler "axial valve" pneumatic hammers.

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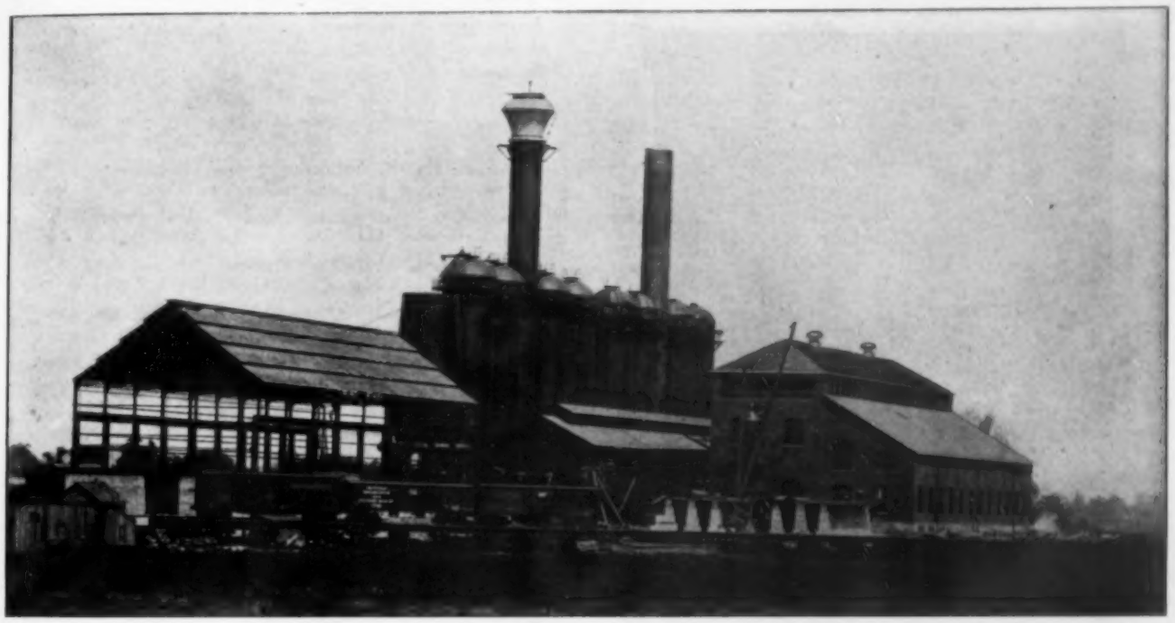
The D. M. Tuttle Co., Canastota, N. Y., has secured a site at Baldwinsville, N. Y., and will move to that town. The company will increase its capital stock to $60,000 and enlarge its facilities for the building of engines and boats.

## THE BUFFALO & SUSQUEHANNA IRON CO.

The accompanying illustration indicates the present status of the Buffalo & Susquehanna Iron Co.'s operations at Stony Point, or South Buffalo, N. Y. Under the direction of Hugh Kennedy, general manager of the company, the work is now nearing completion and the furnace is expected to go into operation toward the end of the year. The structural work is almost finished and all efforts are now centered on installing the blowing engines, pumps, electrical machinery and boilers. The greater part of the lining of the stoves and stacks is already in place.

The work on the ship canal between the property of the Buffalo & Susquehanna Iron Co. and that of the Pennsylvania Railroad Co. is being pushed forward rapidly. Upon the completion of the plant vessels will come via this canal and unload ore directly into the company's stock yard. The iron mines of this company on the Mesabi range at Hibbing, Minn., and on the Menominee range at Iron Mountain, Mich., and its coal fields in the Reynoldsville basin at Sykesville, Pa., are being rapidly developed. Shafts are sunk and the machinery is being assembled. The mine at Iron Mountain is already shipping ore which has been sold in the market. It is coarse and well suited for mining with the finer ore obtained at Hibbing, Minn. Continued explorations in drilling on the latter property indicate that it has upwards of 20,000,000 tons of ore.

The blast furnaces, which are built after designs of Julian Kennedy, are 80 feet high and 20 feet bosh diameter. Together they are expected to produce 600 to 700 tons of foundry pig iron per day. For this output they will require upwards of 2,000 tons of raw materials. The stoves are 90 feet high and 22 feet in diameter. There are 24 boilers with a total of 6,336 h. p.



VIEW OF THE BUFFALO & SUSQUEHANNA IRON CO.'S NEW FURNACE AT STONY POINT, BUFFALO.

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The United States Cast Iron Pipe Co., at Trenton, N. J., has filed an answer to the application of Andrew H. McNeal for the appointment of a receiver. The company claims that it is making money, and that $650,000 has been paid for betterments. The net earnings in 1900 were $946,000, it is asserted; in 1901, $201,000; in 1902, $711,000, and for the year ended May 31, 1903, $1,222,000. The smaller earnings for the year ending May 31, 1901, the answer says, are due to the policy pursued by McNeal himself, who that year was chairman of the company's manufacturing committee.

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The Scranton Steam Pump Co., Scranton, Pa., has bought the plant of the Poore Pump Mfg. Co., of that city. The property inventoried at $45,000, but it was sold at a sacrifice, because of dissatisfaction among the stockholders. The Scranton Steam Pump Co. is now operating three plants.

## COLORADO FUEL & IRON CO.

The annual report of the Colorado Fuel & Iron Co. for the year ended June 30 last was given out at Denver, Sept. 11, by President F. J. Hearne. The net earnings from operating departments carried to the credit of income account were $1,990,982, an increase of $344,921, and of the iron department a decrease of $88,174. The total net earnings from all sources amounted to $2,057,342, which provided for all fixed charges, sinking funds, preferred stock dividends paid Feb. 20, 1903, etc., leaving a balance of $203,611, which was carried to the credit of profit and loss. The balance to the credit of profit and loss account is $586,112, representing accrued and undivided profits at the close of the current business year.

After mentioning the additions made to the plant during the year, the outgoing president, J. A. Kebler, says: "The same difficulties were encountered in operating the Minnequa plant this year as last, and all of the costs were largely increased by reason of the additional expense caused by operating the steel works while so much construction was going on." The auditor's report shows that during the year $5,000,000 of new 5 percent 10-year gold debenture bonds were issued, and the amount outstanding at the end of the year was $14,068,000.

During the year the company mined 5,271,942 tons of coal, compared with 4,281,700 tons in 1902, an increase of 990,241 tons. Its production of coke was 994,752 tons, as compared with 728,197 tons in 1902, an increase of 266,554 tons. The total coal and coke produced last year was 6,266,695 tons, compared with 5,009,898 in 1902, an increase of 1,256,796 tons.

The production of iron and steel for the year was 968,884 tons, compared with 961,086 tons in 1902, an increase of 7,797 tons. The iron ore used was 533,951 tons, compared with 456,117 tons, an increase of 77,833 tons, while the limestone aggregated 217,733 tons. In the disposition of iron and steel the company sold 203,094 tons, used 2,827 tons at the mines and 734,612 tons at the steel works and Laramie.

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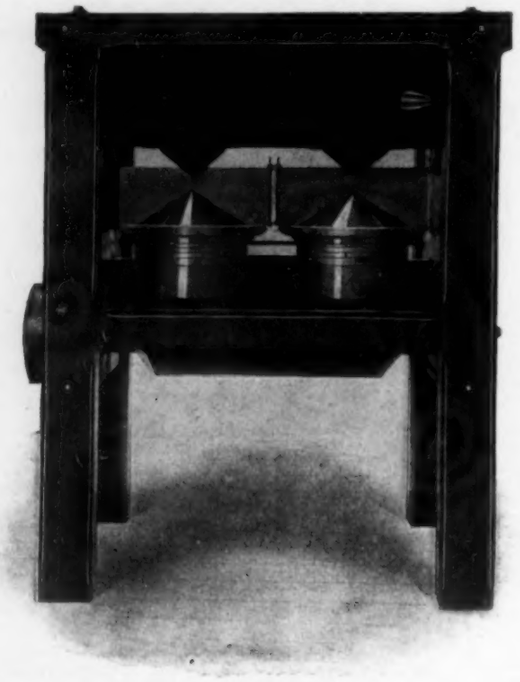
The Burton Stock Car Co.' plant, at Wichita, Kan., has been purchased by the A. C. Randolph Co., of Newton, Ia., which latter company manufactures threshing machine attachments. The company will move to Wichita and occupy the plant just purchased, which consists of five buildings ranging in size from 70x222 ft. to 80x250 ft., besides a store room and foundry. After being erected the buildings were used by the Burton Stock Car Co. but after a few years of operation the machinery was moved to Chicago and the plant has since been idle.

## DOUBLE-TURRETED MAGNETIC SEPARATOR.

What is styled its Type S No. 2 separator has recently been brought out by the Dings Electro-Magnetic Separator Co., of Milwaukee. It is especially designed for handling various kinds of finely crushed material containing magnetite constituents. The distinguishing features are the turret like magnetic devices projecting from the ridge of a double-incline or roof-like divide. The material is fed from a hopper in a concentrated stream upon the apex of half cones or distributers, which are held in position by a brass-sheathed center board, and falls from the base of the half cones in a thin veil-like sheet against rotating magnetic poles. The non-magnetic material falls at once to its final discharge while the magnetite is carried to the opposite side of the turret and discharged. The material being treated is thrown, not only in the path of an intense magnetic flux, but in direct contact with the magnetic poles themselves, there being no belts, coverings or shields intervening. The magnetic poles are successively and gradually demagnetized as they recede from the influence of the stationary field coil, offering an opportunity, when desired, of subdividing the magnetite material according to difference in magnetic susceptibility.

The frames are made of seasoned maple solidly bolted together. The magnets are of dynamo steel and all electrical



A NEW MAGNETIC SEPARATOR.

parts are insulated. The turret shafts are made of phosphor bronze and run in steel bearings. The distributing cones are of heavy cast bronze.

The double turreted separator as shown by the accompanying illustration has a nominal capacity of 2,000 pounds per hour. Its extreme height is 66 inches; it occupies a floor space of 36x48 inches and weighs 1,200 pounds when boxed for shipment. It has a large hopper, with delivery high enough from the floor to permit of receiving the different separations in wheelbarrows. The power required is 1 ampere at 110 volts for magnetic purposes, and about ½ horsepower for mechanical drive. In its working the machine is automatic and continuous. The winding is for operation with any direct current system of from 3 to 500 volts, but the separator cannot be operated with alternating current. Where electricity is not available a small dynamo is furnished.

The special fields for this separator are the following: In mines—concentrating magnetite sand and specular iron ore; separating zinc and iron sulphides; treating chalcopyrites for copper values; handling nickeliferous ore, garnets, rutile, etc. In blast furnaces—concentrating flue dust for briquetting. In carbon factories—removing iron from carbon flour. In quartz mills—removing iron from enameling quartz. In glass works—removing iron from sand.

## CONDITION OF THE FOUNDRY TRADE.

The reports from the various local unions of molders made monthly to the *Iron Molders' Journal*, the organ of the union, are a good index in general to trade conditions in foundry centers. The September issue of the *Journal*, containing reports for the month of August, presents an interesting commentary on the situation in the closing month of the summer. Whether some betterment may be found in the September reports that will appear in October is an open question. August business was affected by strikes, some of which have been settled, and by the summer suspensions in foundries connected with agricultural works, as well as by shut-downs for repairs in a good many plants, though the effect of the restriction from the latter cause is counteracted in part by the demand for castings for these repairs. However, the showing is in contrast with that for the same period in 1902, and to some extent may reflect a change in the pace of industrial operations. We quote below the brief comments of the *Journal* correspondents on trade conditions at a number of foundry centers:

Philadelphia—Fair (stove and hollow-ware); slack with molders walking the street (machinery).
Cincinnati—Slack (machinery and bench); fair (stove).
Troy, N. Y.—Fair.
Worcester, Mass.—Very slack.
Jersey City, N. J.—Slow.
Albany, N. Y.—Slacking up.
Rochester, N. Y.—Strike on.
Buffalo, N. Y.—Fair (stove); slacking up (machinery).
St. Louis—Fair (stove); slacking up (machinery and bench).
Louisville, Ky.—Good (stove); fair (machinery).
Allegheny City, Pa.—Fair (stove).
Indianapolis, Ind.—Good (stove); fair (machinery and bench).
Covington, Ky.—Fair (stove and machinery).
Montreal, Que.—Slacking up.
Brooklyn, N. Y.—Fair (heater work and machinery).
Chicago—Fair (stove).
New York—Slacking up (machinery).
Hamilton, Ont.—Not very good (stove and machinery).
Cleveland—Still very dull (stove).
Toronto—Strike on.
Akron, O.—Slack (stove, machinery and agricultural).
Detroit—Fair (stove and bench).
York, Pa.—Fair with plenty of molders.
Reading, Pa.—Fair, with plenty of molders.
Wilmington, Del.—Fair.
Erie, Pa.—Slack (machinery, stove and bench).
Newark, N. J.—Slow on machinery and jobbing.
Providence and Pawtucket, R. I.—Very dull.
Quincy, Ill.—Good (stove); dull (machinery).
Pittsburg—Slack.
Seneca Falls, N. Y.—Slack; five days per week (machinery).
New Haven, Conn.—Dull, with plenty of molders.
Fort Wayne, Ind.—Good.
Hamilton, O.—Fair; strike at one shop
Derby and Ansonia, Conn.—Fair.
Springfield, O.—Not so good (agricultural and machinery).
Elizabeth, N. J.—Very dull; laying off men.
Columbus, O.—Stove plate good; bars and knuckles slack.
Lynn and Salem, Mass.—Slack.
Boston—Not very good (bench and machinery).
Philadelphia—Bad; molders walking the streets (bench).
Utica, N. Y.—Slow (machinery, stove and heater).
East St. Louis—Fair.
Milwaukee—Good (bench); middling (machinery); good at Allis-Chalmers works.
Schenectady, N. Y.—Slack; laying off molders in General Electric.
San Francisco—Fair, with plenty of molders.
Minneapolis, Minn.—Getting slack.
Toledo, O.—Slack.
Dayton, O.—Fair.
Denver, Col.—Fair; laying off men.
Omaha, Neb.—Dull.
Sheffield, Ala.—Good.
Youngstown, O.—Slow.
Cleveland—Very dull (machinery).
St. Paul, Minn.—Bad.
Chicago—Fair (machinery); middling (bench).
Detroit—Fair (malleable).

# INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

**New Buyers in the Market and Some of Their Wants:—**

The Peerless Manufacturing Co., Hopkinsville, Ky., has been incorporated, with capital of $10,000, for manufacturing machinery, tools and other patented articles.

Madison L. Christian, of Louisville, Ky., has, with others, organized the Christian Machine Shops & Foundry, and will establish plant at Cloverport, Ky.

The Waters-Barber-Treece Co. has been incorporated at St. Louis, with capital of $10,000, for manufacture of farming implements, wagons, etc., by William Waters, Cicerre Barber, W. H. Treece and others.

B. S. Lucas, Roper, N. C., wants 40-horsepower and a 20-horsepower return tubular boiler.

Jefferson D. Marks, Crowley, La., will want 150-horsepower engine and 100-horsepower boiler.

Clark & Hines, 809 Equitable Building, Baltimore, Md., are in market for cast iron borings.

The California Boiler Works, of San Francisco, has been organized. The directors are J. C. Lemmer, W. H. Lemmer, John Berger, Edward Redmond and Charles Jellinek. The capital stock is $25,000.

The Enid Machinery & Supply Co., of Enid, Okla., capital stock, $25,000, has been incorporated by Dr. E. E. Cowdrick, S. V. Jett, J. A. Olinger, F. B. Funk, J. B. Ferguson and W. J. Olinger.

The American Power Co., of Minneapolis, Minn., has filed articles of incorporation. The company will maunfacture motors and machinery, and is capitalized for $600,000. The officers are: President, Joseph L. Michaels; vice president, Lee S. Ovitt; secretary, F. E. Plummer; treasurer, S. M. Moulton.

The Vaughan-Road Machine Co. has been organized at Portland, Me., to deal in machinery; capital, $300,000. Incorporators: Dwight W. Vaughan, president; George C. Vaughan, Salem, Mass.; John Road, treasurer, Danvers, Mass.

The Butler Foundry & Machine Co. has been formed with a capital stock of $500,000. A site of 23 acres for a plant has been secured about one mile north of Butler, Pa.

The firm of Joshua Oldham & Sons, of Brooklyn, N. Y., has been organized to manufacture machine tools. Directors: Henry Tomkins, Joshua Oldham and E. R. Oldham, all of Brooklyn.

The Alabama Horseshoe Co. has been granted a charter under the laws of Delaware with a capital of $200,000. The principal place of business will be Birmingham, Ala. The company will manufacture horseshoes and other products of iron and steel.

The Geneva Iron Co., of Superior, Wis., captial, $20,000, has been incorporated.

The Belting & Machinery Co., Rochester, N. Y., has been incorporated with a capital of $50,000.

The Standard Mfg. Co., of Piqua, O., has been incorporated with a capital of $30,000 to manufacture sheet metal goods. The incorporators are: Wm. F. Lentz, Theo. H. Norr, R. J. De Weese, John H. Baker and R. W. Levitt.

The Woodward Rotary Engine Mfg. Co., Woodward, Mo., has been incorporated with a capital of $50,000.

**Fires and Accidents:—**

Chas. Gross, superintendent of A. M. Byers & Co.'s tube mills, Pittsburg, which were partly destroyed by fire Sept. 6, estimated the loss at about $50,000, insured. The buildings will be rebuilt on the same site.

The plant of the Southern Foundry Co. at Owensboro, Ky., was almost totally destroyed by fire Sept. 5. The loss is $20,000, with $4,000 insurance. The company had a number of large contracts on hand and had just filled a contract for the World's Fair buildings in St. Louis.

The Blue Grass Stove & Iron Works, Lexington, Ky., was visited by fire Sept. 6. Loss, $25,000; insurance, $2,000.

The plant of the Ideal Stove & Foundry Co., at Daleville, Ind., was destroyed by fire Sept. 8. The loss is estimated at $10,000.

During a storm the building occupied by the Jackson Foundry & Machine Co., at Jackson, O., was badly wrecked. The machinery was also damaged.

**New Construction:—**

The American Steel & Wire Co., of Worcester, Mass., is to build a machine shop at the south works in Quinsigamond at an estimated cost of $30,000. The plans call for a building 100x160. In addition there is to be a power house at an estimated cost of $3,600.

The Marinette Brass Foundry, at Marinette, Wis., is to be enlarged. A new site has been secured and the foundry will be moved. The proprietor, O. P. Chatfield, has also decided upon a new foundry and machine shop at Escanaba. A contract has been let for a building 40x80 feet.

Ground has been broken for the new plant of the Birmingham Drop Forge Works, at Birmingham, Ala.

The Northwestern Boiler Co. has let the contract for its new building at Rice's Point, Duluth. The building alone is estimated to cost $38,000, and the equipment will make the total cost $140,000. The structure will be of brick and steel.

The Minneapolis Threshing Machine Co., at Hopkins, Minn., is increasing the dimensions of its foundry to 85 by 200 feet. The entire cost of the improvements in building and equipment will be about $12,000.

Barnhardt & Davis, Warren, Pa., have nearly completed the erection of a new building 40x70 feet, two stories, and will do general jobbing work in brass and iron, and also turn out shafting, foundry patterns, iron and wood pulleys and saw mill machinery.

The plant which the Deering division of the International Harvester Co. is building at Hamilton, Ont., for the manufacture of agricultural implements for the Canadian market, covers 7 acres, and is located on the shore of Lake Ontario. Over 2,000 men will be employed.

The American Emery Wheel Co., Providence, R. I., will erect a new building of brick, two stories, 34x116 feet, and a brick engine and boiler house, 26x27 feet. New machinery will be installed.

The Turners Falls Machine Co., Turners Falls, Mass., is moving into its new buildings, two stories, 50x125 feet. Considerable new machinery has been installed.

The new addition of the Warner & Swasey Co., Cleveland, O., 50x205 feet, will be used as an erecting shop. It will be completed by the middle of October.

The Chattanooga Machinery Co., Chattanooga, Tenn., has almost completed the three large buildings which it is erecting. It is expected that machinery will be installed by Oct. 1. The machinery shop is 120x145 feet; the foundry, 70x64 feet, and the blacksmith shop, 30x50 feet.

The new boiler shop of Hill & Keenan, So. Chicago, Ill., has been completed and will be in operation next week. The building is 40x86 feet, with an office adjoining.

The Topeka Steel Bridge Co., Topeka, Kan., has decided to move the parent plant from Elizabeth, Ill., to Topeka and consolidate the two. A stock company will be formed and the plant enlarged.

The Domestic Sewing Machine Co., Newark, N. J., will erect a one-story brick boiler, pump and engine room at a cost of $7,630.

H. W. Spaulding and A. A. Koch, of Montezuma, Ia., will open a general machine shop and foundry at Grinnell, Ia. A stock company with a $10,000 capital has been organized to erect a building 60x100 feet, two stories.

The recent incorporation of the W. A. Jones Foundry & Machine Co., Chicago, will make no material difference in regard to the management of the business. The company contemplates some additions to the plant in the near future.

Plans are being considered for the building of a foundry to cost $65,000 for the Navy Yard, at Boston.

The Morse Twist Drill & Machine Co., New Bedford, Mass., is adding two stories to a one-story building, 40x170 feet, and three stories to a one-story building, 40x75 feet. Other improvements are to be made.

The Coshocton Machine Co., Coshocton, O., has leased a lot and will erect a two-story frame building, 34x120 feet. Since the company was incorporated last December its busi-

ness has grown rapidly and its present quarters are inadequate.

A 200-foot addition is to be built to the boiler shop of the Holthoff Machinery Co., Cudahy, Wis. A foundry is also to be erected.

The Shackleton Mfg. Co. will erect a foundry and machine shop at York, Pa.

Foundations are being laid for the 55x280-foot foundry and power house of the Black-Clausen Co., of Hamilton, O.

**The Pittsburg and Valley Districts:—**

The plant of the Eleanor Iron & Steel Co., Irwin, Pa., is being removed to the company's new site at Butler, Pa., and it is expected that the machinery will be in place in about 90 days. In addition to the old works two open-hearth furnaces of 35 tons capacity each and a sheet bar mill are to be installed.

For the protection of its immense plants at East Pittsburg, Pa., the Westinghouse Electric & Mfg. Co. has decided to provide its own fire department. An engine house will be built at a cost of $30,000 and it will be equipped with the most modern fire fighting apparatus.

The South Side plant of the Westinghouse Machine Co., Pittsburg, is being dismantled as the company's Trafford City foundry is now in operation. The site of the foundry has been purchased by the Wabash railroad and will be used for railroad yard purposes. The plant was originally built by the Robinson-Rea Machine Co., and was subsequently purchased by the Westinghouse Machine Co.

No. 2 blast furnace of the LaBelle Iron Works, Steubenville, O., will be blown in about Jan. 1. Considerable difficulty has been experienced in securing material for the erection of this plant, and construction has been delayed fully 2 months up to date. With this furnace in operation, the company will be entirely independent of the pig iron market, the output of the two furnaces being sufficient to supply the requirements of its mills and steel plant.

A wooden oil tank, containing 24,000 gallons of oil in the yards of the Park plant of the Crucible Steel Co. of America, Pittsburg, Pa., was destroyed by fire this week.

The Riter-Conley Mfg. Co., Pittsburg, has been awarded the contract for building 12,000 feet of 50-inch pipe for the Mexican Light & Power Co., Ltd., of Hexaca, Mexico. The pipe will require about 1,800 tons of plates.

The foundry of the Standard Engineering Works, Ellwood, Pa., is fast nearing completion. A 50-ton Niles crane is already in place and is facilitating the handling of material for the erection of the plant.

Elliott & Baton, civil and mining engineers, Pittsburg, Pa., have been awarded a contract for the erection of 400 beehive coke ovens for the International Coal & Coke Co., of Grand Forks, B. C. The coal is of a good coking variety and it is probable that the coking operations will be still further extended in the near future.

The tin house of the Pope Tin Plate Co., Steubenville, O., has been shut down for repairs. Operations will be resumed on Oct. 1.

The Brier Hill Coke Co., of Youngstown, O., has awarded contracts for the erection of its mining plant at Searight in the Connellsville region. The buildings are to be of blue stone and will include a boiler house, engine house, machine shop, carpenter and blacksmith shops and lamp house and office. The company owns 1,200 acres of coal and has 300 ovens in course of erection.

The South Sharon, Pa., plant of the American Tin Plate Co. has been shut down for an indefinite period for repairs.

Fires at the new plant of the Sligo Iron & Steel Co., Connellsville, Pa., were lighted last week. Mary McConnell, the youngest daughter of General Manager Joseph McConnell, applied the torch to the furnaces. A large portion of the machinery of the plant was purchased from the Sligo mills on the South Side, Pittsburg, and the good will and brands were also purchased. Bar iron and merchant shapes will be rolled.

**General Industrial Notes:—**

The M. A. Cook Boiler Co. will move its plant from Nashville, Tenn., to Peoria, Ill., and will occupy the old O'Brien foundry building. It will be thoroughly overhauled and used until a new building is erected at some future date.

The Lamb Mfg. Co., of South Sioux City, Neb., is looking for a new location. The company manufactures sad irons and does a general foundry business. It has a capital of $150,000. W. W. Lamb is president.

The report of the receiver of the Wabash Bridge & Iron Co., Wabash, Ind., shows the liabilities to be $275,000 and assets $87,000.

The large new plant of the Foster Stove Co., Ironton, O., has been completed and is the most complete in that region. The company expects to make the first cast this week. The Foster ranges and slack-burners will be the company's specialties.

Last week the plant of the Belfont Iron Works Co., Ironton, O., went on double turn and the Kelly Nail & Iron Co. will also put on an extra turn if the supply of rods will warrant it. The rod mill at Ashland, Ky., is in operation and furnishing the supply for the two mills at Ironton and the Norton mill at Ashland.

Owing to delay in getting important tools, on which contracts were made for June delivery, the large plant of the Ironton (O.) Engine Co. has been unable to begin operation. It is now expected it will make its first cast by Oct. 1.

The Hattie Ensley furnace of the Sloss-Sheffield Steel & Iron Co., at Sheffield, Ala., will go in blast Oct. 1. This will make seven furnaces of this company in operation.

The Springfield, Ill., plant of the Republic Iron & Steel Co. will start up this week.

The Ball Engine Co., Erie, Pa., which is installing three 400-h. p. vertical cross compound direct connected engines in the Oliver Building, Pittsburg, has just received an order for an additional unit, a 700-h. p. vertical cross compound Corliss direct connected engine. This will make one of the largest isolated plants in Pittsburg.

The Dunbar Furnace Co., Scottdale, Pa., has entered into a contract for the disposal of a large portion of its slag to the Warren Ehret Co., of Philadelphia, to be used in the manufacture of roofing material.

Judge Putnam, of the United States Circuit Court at Portland, Me., has ordered that the property of the Hyde Windlass Co. belonging to the United States Shipbuilding Co. be turned over to the receiver. The application for possession of the Bath Iron Works was denied because of the fact that at the time of the lease there were on hand certain contracts which the United States Shipbuilding Co. knew could not be completed within the year for which the lease was to run.

Following are the conditions upon which the Dominion Iron & Steel Co., of Sydney, N. S., has agreed to surrender the lease of the Dominion Coal Co.: "The Dominion Coal Co. is to pay to the steel company $2,635,000, is to assume the current liabilities for wages, supplies, etc., of the coal department of the steel company's business and is to relieve the benefits of the current cash assets of the business." These are all good value and the amount they should realize after payment of current liabilities would be about $1,500,000. The coal company therefore pays about $1,100,000 as a consideration for the surrender of the lease and revision of coal contracts.

The first carload of pipe shipped by J. K. Dimmick & Co., of Birmingham, on their contract with the city of Cincinnati proved unsatisfactory and was rejected. It developed upon investigation that through an error the wrong car of pipe was sent to Cincinnati, and the pipe intended for that city was sent to another point. It was also ascertained that the rejected pipe was not even water pipe and was only intended for drainage purposes. The matter has now been fully explained to the city officials and the right consignment of pipe is on its way to Cincinnati.

It is reported that the piecework system at Woolwich Arsenal, England, is to be discontinued. The authorities have decided to introduce a bonus system. A fixed price and time is put upon a job. If the man finishes it in the exact time set he receives a certain sum. If, on the other hand, the workman completes the task under time, he receives a percentage of the time saved estimated in money.

The Dow Wire Works Co., Louisville, Ky., has secured a building located on three acres of ground, and will soon have increased facilities for its business.